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ABSTRACT

The purpose of this Resource Agent Project was to assist the Fund for the Improvement of Postsecondary Education (FIPSE) and the postsecondary education enterprise in developing policy and program responses to the diverse problems associated with a changing economy. The project's three functions were to (1) examine policy directions related to the economy; (2) develop a network among FIPSE-supported projects in education and economics; and (3) disseminate program and policy information generated by the project. It was an experiment of FIPSE to see if clusters of projects, working in similar areas, could be formed to address common problems in a collaborative way. The project's activities were policy papers, a newsletter, case studies, the "New Directions for Continuing Education Sourcebook," and the Education and Economy Alliance. It convened a group of 24 other FIPSE projects to form the Education and Economy Alliance. Each of the projects in the Alliance was concerned with improving postsecondary educations' ability to respond to changes in the economy. The goal of the Education and Economy Alliance was to "make the whole more than the sum of its parts" in terms of identifying new policies and practices for postsecondary education responses to the changing economy. The appendix includes copies of all projects developed as a part of the Alliance project. (SM)

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Postsecondary Education for a Changing Economy: Resource Agent for Policies and Practices

ED 298844

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National Institute for Work and Learning
1200 18th Street, N.W., Suite 316
Washington, D.C. 20036

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SUMMARY

The Postsecondary Education for a Changing Economy: Resource Agent for Policies and Practices project was not a typical FIPSE project. The Resource Agent Project convened a group of twenty-four other FIPSE projects to form an Education and Economy Alliance. Each of the projects in the Alliance was concerned with improving postsecondary education' ability to respond to changes in the economy. The aim of the Resource Agent project was to make "the whole of the alliance projects more than the sum of the parts" in terms of identifying new policies and practices for postsecondary education responses to a changing economy.

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Project Reports and Products:

"Demographic and Economic Changes and Postsecondary Education"

"Exploring New Concepts for Postsecondary Education"

"From Broad Strategies to Specific Ideas: Initial Thoughts of the Education and Economy Alliance"

"Postsecondary Responses to a Changing Economy"

"Higher Education Partnerships: Practices, Policies, and problems"

"Building Effective Business/Higher Education Partnerships for Economic Development"

"Higher Education and the State: New Linkages for Economic Development"

"Partnerships, Higher Education, and Economic Development"

"Economic Literacy"

"Liberal Education and Education for Work"

"Renewing Scientific/Technical Careers"

"For Your Information" (Newsletter), January 1985

The Eear - Education and the Economy Alliance Report - August 1985, Spring 1986

"The Business Development and Training Center: A Case Study of an Educational Maintenance Organization"

"English Language Training for the Workplace: A Case Study of the Language Working Program"

"Technican Training for Women and Minorities: A Case Study of the Intensive In-Plant Training Program"

Responding to the Educational Needs of Today's Workplace

Executive Summary

Postsecondary Education for a Changing Economy: Resource Agent for Policies and Practices

National Institute for Work and Learning
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Project Overview

The Resource Agent Project was not a typical FIPSE project. The Resaource Agent Project served three functions:

1. Explored new policy directions for postsecondary education's responses to a changing economy.
2. Developed a network among FIPSE supported projects working in the education and the economy area.
3. Disseminated program and policy information generated through the project.

A number of activities took place during the project to serve these functions. Six meetings of the Education and Economy Alliance were convened. The Alliance was comprised of the FIPSE projects in the education and economy area. A series of policy papers were written and disseminated to policy makers, program developers and program operators. Three issues of an information newsletter was disseminated to the field and a number of project case studies prepared. A monograph in the Jossey-Bass New Directions for Continuing Education series was written based on the projects in and activities of the Alliance.

Purpose

The purpose of the Resource Agent project was to assist FIPSE and the postsecondary education enterprise to develop policy and program responses to the diverse problems associated with a changing economy. Responses that would impact individual adult learners, employers and other organizations, and communities. The Resource Agent would work with the FIPSE projects in the education and economy area to "make the whole more than the sum of the parts." That is, the projects in the education and economy area would serve as a springboard for generating new program and policy ideas. Ideas and options that would go beyond any one of the projects.

Background and Origins

The Resource Agent project was an experiment of FIPSE. Could clusters of projects, working in similar areas, be formed to address common problems in a collaborative way?

Project Description

The Resource Agent project had a number of activities. Each is outlined below.

1. Policy Papers

A series of policy papers were written as part of the project. Each is listed below.

"Demographic and Economic Changes and Postsecondary Education"

"Exploring New Concepts for Postsecondary Education"

"From Broad Strategies to Specific Ideas: Initial Thoughts of the Education and Economy Alliance"

"Postsecondary Responses to a Changing Economy"

"Higher Education Partnerships: Practices, Policies, and problems"

"Building Effective Business/Higher Education Partnerships for Economic Development"

"Higher Education and the State: New Linkages for Economic Development"

"Partnerships, Higher Education, and Economic Development"

"Economic Literacy"

"Liberal Education and Education for Work"

"Renewing Scientific/Technical Careers"

2. Newsletter

A periodic newsletter was prepared and disseminated as part of the project. Each issue of the Eear (Education and the Economy Alliance Report) highlighted several of the projects that were part of the Alliance; reported on other projects that were involved in education for a changing economy; provided information on conferences; and reviewed books and journals in the field.

3. Case Studies

Case studies of three of the Alliance projects were undertaken. The purpose of these case studies was to describe and assess the projects. The three case studies are:

"The Business Development and Training Center: A Case Study of an Educational Maintenance Organization"

"English Language Training for the Workplace: A Case Study of the Language Working Program"

"Technican Training for Women and Minorities: A Case Study of the Intensive In-Plant Training Program"

4. New Directions for Continuing Education Sourcebook

Toward the end of the project, the Project Director and the former FIPSE Program Officer edited a sourcebook in the Jossey-Bass, Inc. New Directions for Continuing Education Series. The sourcebook was based on the assumption that the integration of education and work, whether formal or informal, is critical to the survival of our nation's economy. The general purpose of this volume was to examine how postsecondary education can be responsive to the changing needs of industry and adult workers and to suggest how continuing education can develop and enhance programs that integrate education and work.

5. The Education and Economy Alliance

Twenty-five projects made up the Education and Economy Alliance. The Alliance met a total of six times over the life of the project. The activities of the Alliance included the following: sharing of project information including successes, problems, and strategies; review of policy papers; identification of critical themes; discussion of critical issues; and writing of policy papers.

The goal of the Alliance was to "make the whole more than the sum of its parts." The meetings allowed the participants to explore new ideas with "people they trust" and to gain new perspectives to be more effective change agents. A network was developed that helped each project do a better job. The Alliance explored a set of issues on partnerships, liberal education, and economic literacy that represent potential new directions for postsecondary education. While the team writing, that was a goal of the Alliance, was not a complete success, the discussions of the issues provided a great deal of information, and insight on new directions. The Alliance set an agenda for postsecondary education that each member will carry as they direct future projects and dialogue with other colleagues in the field.

Project Results

The results of the project are the papers and reports outlined above and provided in the appendix. They have been widely disseminated to the field.

No formal evaluation was undertaken because of the nature of the project. Overall, however, the project must be viewed as a success. The major problem centers around time. The Alliance members needed to have their time on this effort covered. While they participated in all of the meetings, the writing assignments took a back-burner to their own project direction. Each should have had five days per year set aside for work as Alliance activities, in addition to their participation in Alliance meetings.

The appendix includes copies of all of the products that were developed as a part of the Alliance project. Copies of all papers are available from the National Institute for Work and Learning at a nominal cost.

Summary and Conclusions

The Education and the Economy Alliance generated a number of important and critical issues for the postsecondary education enterprise. The Resource Agent project was essential for coordinating and "leading" the group. The idea of a "cluster" of projects was a very good one and the result of the endeavor was that "the whole became much more than the sum of the parts." FIPSE should consider this type of activity again in the future. It needs, however, to include enough resources to cover some time for the cluster members if writing and other cluster-related activities are to take place.

APPENDIX

Alliance Products and Reports

1. Demographic and Economic Changes and Postsecondary Education
2. Exploring New Concepts for Postsecondary Education
3. From Broad Strategies to Specific Ideas: Initial Thoughts of The Education and The Economy Alliance
4. Postsecondary Responses to a Changing Economy
5. Higher Education Partnerships: Practices, Policies, and Problems
6. Building Effective Business/Higher Education Partnerships for Economic Development
7. Higher Education and the State: New Linkages for Economic Development
8. Partnerships, Higher Education, and Economic Development
9. Economic Literacy
10. Liberal Education and Education for Work
11. Renewing Scientific/Technical Careers
12. Copies of the Eear Newsletter
13. The Business Development and Training Center: A Case Study of an Educational Maintenance Organization
14. English Language Training for the Workplace: A Case Study of the Language Working Program
15. Technician Training for Women and Minorities: A Case Study of the Intensive In-Plant Training Program
16. Responding to The Educational Needs of Today's Workplace
17. The Education and Economy Alliance

Postsecondary Education for a Changing Economy: Resource Agent for Policies and Practices

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Project Overview

The Resource Agent project was not a typical FIPSE project. In the Spring of 1983 FIPSE staff came to the National Institute for Work and Learning (NIWL) as asked if it would write a paper on postsecondary responses to changes in the economy. Fourteen projects that comprised a loosely formed cluster of FIPSE projects in the postsecondary education and the economy area would serve as a springboard for the paper.

The paper focused on postsecondary education's responses to changes in the direction and pace of the economy. In Section I the common threads or themes that underlie the projects in the FIPSE cluster were explored. This was followed by a brief examination of specific project responses to the demographic and economic factors affecting the United States.

In the second section, specific policy and program options were suggested to facilitate postsecondary education's responses to these changing realities. This section examined ways in which postsecondary institutions, through their FIPSE projects, were doing things differently. Section III provided an analysis of future options for postsecondary education's responses to economic change. This section detailed a set of new ideas or innovative ways for postsecondary education to respond to the changes that are anticipated for the American population and economy.

The paper concluded that postsecondary education policies and practices should be adopted to the changing skill needs of adults and of employing organizations, and to assist adults to respond better psychologically and in life planning to shifts in the economy.

Based on the paper and a meeting with the projects in the cluster, NIWL developed a proposal for submission to FIPSE's Comprehensive Grant Program. The proposed Resource Agent Project would serve three functions:

1. Explore new policy directions for postsecondary education's responses to a changing economy.

2. Develop a network among FIPSE supported projects working in the education and the economy area.

3. Disseminate program and policy information generated through the project.

A number of activities took place during the project to serve these functions. Six meetings of the Education and Economy Alliance were convened. The Alliance was comprised of the FIPSE projects in the education and economy area. A series of policy papers were written and disseminated to policy makers, program developers and program operators. Three issues of an information newsletter was disseminated to the field and a number of project case studies prepared. A monograph in the Jossey-Bass New Directions for Continuing Education series was written based on the projects in and activities of the Alliance. Copies of the papers, newsletters, case studies, and monograph are provided in the Appendix of this report.

Purpose

The purpose of the Resource Agent project was to assist FIPSE and the postsecondary education enterprise to develop policy and program responses to the diverse problems associated with a changing economy. Responses that would impact individual adult learners, employers and other organizations, and communities. The Resource Agent would work with the FIPSE projects in the education and economy area to "make the whole more than the sum of the parts." That is, the projects in the education and economy area would serve as a springboard for generating new program and policy ideas. Ideas and options that would go beyond any one of the projects.

Background and Origins

The Resource Agent project was an experiment of FIPSE. Could clusters of projects, working in similar areas, be formed to address common problems in a collaborative way? NIWL developed a proposal to serve as a Resource Agent in the education and economy area. NIWL had a long history of working on collaborative projects and extensive experience and expertise related to linking the institutions of education and work.

NIWL, as an organization, seeks to improve the relationships between institutions of work and of learning; to facilitate linkages between education and work for youth and adults; and to bring the supply of and demand for critical skills into better balance. The means to these ends have taken a variety of forms, including: research, pilot programs, case studies, policy studies, information networking, and technical assistance.

While the means vary, a common thread runs through all NIWL undertakings: the pursuit of collaborative efforts among employers, educators, unions, service organizations, and government to resolve work and learning problems. The development of collaborative processes at local, state, and national levels has been a consistent focus of the Institute since its creation in 1971.

The NIWL agenda is carried out through projects in three related program areas:

1. Youth Development. NIWL contributes to: better education-work transitions; greater private sector involvement to increase public school effectiveness; and closer relationships among employers, unions, and education institutions.

2. Worklife Transitions. NIWL seeks to aid worklife transitions made necessary by new technology, changing skill needs, plant closings, structural changes in the economy, the movement of women into the labor force, and the prospects of retirement.

3. Critical Skills. NIWL focuses on critical skill needs: identifying skill shortages and bottlenecks to their supply; and developing efforts to increase the number of persons with skills critical to industry and the economy.

The Resource Agent Project was therefore a natural addition to the projects the Institute had and was then undertaking.

Project Description

The Resource Agent project had a number of activities. Each is described in turn.

1. Policy Papers

A series of policy papers were written as part of the project. Each is briefly described below.

"Demographic and Economic Changes and Postsecondary Education" discusses the changes in the economy that postsecondary education will face throughout the remainder of the twentieth century. Demographic and economic shifts are discussed in terms of specific trends and in terms of how the FIPSE "cluster" of projects has responded to the trends.

"Exploring New Concepts for Postsecondary Education" proposes a set of strategies that span the boundaries of postsecondary education resources. Specific project ideas are provided (as examples) for each of three general strategies. Meta-Connections Strategy refers to a more comprehensive link between postsecondary education, on the one hand, and other institutions and individuals, on the other hand. Homes-Education refers to those strategies which use the environment for developing content and modes of delivery for postsecondary education and training programs. It refers to instruction or activities that take place in a congenial environment for the purpose of bringing about changes in information, knowledge, or skills. Strategic Planning focuses on developing a good fit between postsecondary education activities and the needs and demands of the surrounding environment. Strategic planning would emphasize flexibility and quick responses to changes in the external environment. In strategic planning the following are continually assessed: the market for educational goods and services; trends in the local labor market and economy; demographic shifts; and the services that are currently available to respond to the surrounding environment. Under strategic planning no single plan would be developed but rather a stream of critical decisions would be made that help postsecondary education respond to its external environment and move into the future.

"From Broad Strategies to Specific Ideas: Initial Thoughts of the Education and the Economy Alliance" represents the Alliances development of the Homes-Education and Strategic Planning concepts into more concrete ideas, themes, and issues. Under the former concept the paper explores the place of liberal arts and general education in "education for work" and professional development programs. For the later concept the paper examines issues related to economic literacy.

"Postsecondary Responses to a Changing Economy" uses the twenty-two projects that comprised FIPSE's Education and Economy Alliance as a springboard, to focus on postsecondary education's responses to changes in the direction and pace of the economy. The paper explores the common threads or themes that underlie the projects. The FIPSE projects are then discussed in terms of new directions for postsecondary education. Content, modes of delivery, sources, and financing are considered to be the resources that comprise the postsecondary education system and the Alliance projects are described in terms of how they have affected changes in these resources. The projects are then further discussed under one of three alliance themes: partnerships for basic skills and adult literacy, partnerships for professional skills and development, and partnerships for economic and community development. The paper ends with a s set of critical questions for postsecondary education policy makers and program operators. The paper was presented at the 1985 National Conference of the American Association of Higher Education.

"Higher Education Partnerships: Practices Policies, and Problems" describes different categories of partnership and discusses issues related to who collaborates. Research partnerships, economic development partnerships, and human resource development partnerships are described and examined. Issues related to understanding who collaborates and who benefits from collaboration are discussed in terms of: effects of the mission; focus of the organization; level of leadership; and depth of collaboration. Projects from the Alliance are used as examples in the discussion. An abridged version of the paper appeared in Community Services CATALYST.

"Higher Education and the State: New Linkages for Economic Development" examines higher education's connection to state legislatures and how such partnerships can enlarge opportunities for regional economic development. Partnerships between higher education and the states in New England, Georgia, Iowa, Pennsylvania, and Massachusetts are reviewed. The broadening role of higher education in the economy and its new responsibilities to state legislatures also are examined.

"Partnerships, Higher Education, and Economic Development" reviews the advantages of effective partnerships between higher education, business, labor unions, and government. It examines strategies for creating and maintaining effective partnerships. The paper assesses the reasons higher education, business, unions, and states should enter into partnerships. A set of policy recommendations is proposed for encouraging, improving, and supporting joint ventures among higher education, business, labor, and government.

"Economic Literacy" examines the issue of the place of economic literacy in our adult education and training system. The importance of economic literacy is argued for in light of a rapidly changing and more sophisticated economy and the need for an informed electorate. Economic literacy programs are discussed in terms of skills taught, information provided, and involvement of participants in a process of developing and using information. A set of strategies for implementing economic literacy programs also are provided.

"Liberal Education and Education for Work" examines the goals of liberal education and education for work and explores the nexus between the two. The valued characteristics of the liberal arts are examined in terms of a body of knowledge which defines and shapes culture, society and ideas. The valued characteristics of liberal education are then explored as an education or learning experience which liberates one personally and provides the skills and knowledge to be effective, self confident, competent, and self directed. This is followed by a discussion of the valued characteristics of education for work as a means of preparing one not only for a job but for future roles and responsibilities. The perspectives of postsecondary education and of business on these issues are then examined. Differences between liberal education and education for work are explored and ways of bridging the gaps between the two proposed.

"Renewing Scientific/Technical Careers explores the distinctive needs of scientists and other technically specialized professionals in mid-career. Two of the Alliance projects are used as the basis for the paper which addresses the needs of mid-career scientists and options for postsecondary education to meet these needs. Career counseling materials for assessing and communicating transferable skills are presented and academic advising procedures related to career management needs are discussed. Case examples are used to portray how career counseling and academic advising can help scientists who struggle in the midst of career and life changes.

2. Newsletter

A periodic newsletter was prepared and disseminated as part of the project. Each issue of the Eear (Education and the Economy Alliance Report) highlighted several of the projects that were part of the Alliance; reported on other projects that were involved in education for a changing economy; provided information on conferences; and reviewed books and journals in the field. Copies of the newsletter are provided in the Appendix.

3. Case Studies

Case studies of three of the Alliance projects were undertaken. The purpose of these case studies was to describe and assess the projects. The description focused on participants, project elements, activities, and relationships among institutions. The assessment examined operational and institutional factors and explored how the project affected changes in partnerships, liberal education, or economic literacy.

"English Language Training for the Workplace" is a case study of the Language Working Program, a joint effort of Arizona State University and the Honeywell Corporation. The goal of the Language Working Program was to develop an approach to English language training, for limited English proficient workers which relates language skills to clearly identified job skills. This overall goal for the program is translated into three specific objectives:

1. To observe and document at one industrial site the language skills needed by limited English proficient (LEP) workers to function effectively in critical job tasks;

2. To utilize this documented information to design and pilot test an on-site "job language" training program for LEP workers; and

3. To document and disseminate the process used in developing this training program so that it may be used in other work and educational settings.

The Language Working Program consists of the following elements: observation and documentation of skills needed by LEP workers; design of the job language program; and delivery of the program. The observation and documentation (needs assessment) involved interviews, observations, and reviews of written materials. A number of functions were identified which became the focus for the design of the curriculum. The functions were related to: carrying out job tasks; social aspects of the job; and advancing at work.

Five training modules were designed around the major language functions at the worksite including: training, meetings, breaks, routine problems, and job advancement. The training program lasted 18 weeks with classes meeting twice a week for 1 1/2 hours. Thirty-six students were divided into three classes based on skill levels. Student assessment was a critical component of the program with four assessment tools used: skills checklists, videotaped interviews, writing samples, and reading tests.

The 36 participants improved their English language skills and gained proficiency in job relate communication. From an educators viewpoint the program was a success because the students made measurable progress in developing their language skills. Students were assessed holistically through tasks which simulated work place activities. For example, pre-post interviews with each student were videotaped. Students demonstrated dramatic improvement on scales developed to measure skill in a number of areas including, fluency, pronunciation, and nonverbal communication.

From industry's perspective the programs was a success because the students' supervisors could report remarkable changes in job performance that in turn could be related to improved quality and productivity.

The students themselves seemed to measure their success in terms of increased confidence and greater comfort in interacting with coworkers and supervisors. They also were ready to take more initiative in reporting problems, making suggestions, and participating in area meetings. Many were for the first time considering applying for job advancement and pursuing formal education.

While the impact of the program on participants is important, the interest of the case study was on the impact of the program on the partnership between the two organizations. The partnership outcomes of the program were discussed in terms of three elements:

- Reciprocal benefits. Both partners anticipated and received concrete benefit from the partnership. In addition, each was cognizant of the benefits anticipated by the other and facilitated their attainment.

- Complementary skills and knowledge. The partners recognized their need for each other. Each brought skills and knowledge not possessed by the other that were critical to the project's success.

- Effective working relationship. The partners established a structure within which they effectively interacted. The structure was flexible and dynamic in nature.

Supported through both formal and informal relationships, the Language Working partnership remained strong and highly visible. Because the company's support for the project was well known, the project had a legitimacy that made employees more willing to become involved and to provide access to information and observation. The visibility of the project meant that some individuals sought out ASU staff and volunteered their help. It was relatively easy to introduce new people to Language Working since most workers already shared a basic level of knowledge about the project.

By structuring a partnership that allowed input and direction from both education and industry, the Language Working project was able to achieve objectives associated with both the education for work familiar to industrial trainers and the liberal education familiar to university faculty. Although the contexts for learning associated with a training center and a college classroom at first appeared disparate, the compatibility of their educational goals became apparent as the partners worked together on a specific instructional program. While abstract discussions may emphasize differences between vocational and academic education, applied work on a concrete learning situation revealed the commonality of the underlying skills required for success in both contexts.

The Language Working training program helped to develop the kind of worker that industry wants and liberal education promotes: an individual trained to communicate effectively, think critically, make decisions, and work as part of a team. The program emphasized the dynamic language skills required to cope with the changing nature of today's work environments. Worker-students learned strategies for adapting to change and for acquiring and imparting new knowledge.

Focusing on generic competencies necessary for creative work and independent learning, this context specific, job-related program was consistent in goals with the most traditional of liberal arts coursework. The collaborative effort that went into developing the Language Working project refutes the current rhetoric decrying the increasing gap between education for work and liberal education. A single program can achieve the purposes of both if an effective partnership is first established.

"The Business Development and Training Center" is a case study of a joint effort between the Compact for Lifelong Educational Opportunities and the Great Valley (PA) Corporate Park to develop an Educational Maintenance Organization. Built on the philosophy of the health maintenance organization the Educational Maintenance Organization (EMO) was initially conceived as creating an overall system of educational service and accountability to be shared by employers, unions, education organizations, and individuals.

Taking the EMO idea as its basis, CLEO proposed to develop an Educational Maintenance Organization (EMO) model with the following distinguishing factors:

1. on-going, on-site provision of a variety of training, counseling and other services as need arose;

2. mutual commitment to supporting a multi-faceted human resources program;

3. a financing structure in which corporations would pre-pay for their services.

It was envisioned that by contracting with CLEO, a company would have access to the teaching, research and consultation capacity of 34 major colleges and universities, and could shift some of the burden of human resource management and training to the EMO organization. The colleges would have gained the understanding and experience to reclaim their role as primary providers of educational services to the business world, and the learners would have gained access to learning resources appropriate to achieving their personal and career goals.

Programs of the Business Development and Training Center (BDTC) included the following: an on-site MBA program; custom-designed training programs; toastmasters; the Human Resource Managers Group; the High Technology Group; the Secretaries and Administrative Assistants Advisory Group; the Executive Roundtable; the Technical Managers Group; the Sales and Marketing Group; Career and Academic Counseling; and the Great Valley News.

The two and a half years of planning, development and operation of the BDTC was a learning time. This new model, created in the high-minded naivete of the academic world, had to make a myriad of adjustments to the reality of corporate America. Among the lessons learned were:

1. There is no question that the need for training and retraining in this transitional economy is enormous, perhaps exceeding the capacity of educational institutions to respond. However, in most small and many medium sized companies, managers either do not perceive that need or are paying it little attention or simply cannot afford to do anything about it. It is in the larger companies that most training takes place or is supported by means of tuition reimbursement. Unless some way is found to aggregate the needs of resources of the smaller companies (a BDTC or a Chamber of Commerce or some other cooperative model), this will remain an under developed market.

2. There is less support for training for blue collar workers unless such support is written into union contracts. The assumption seems to be that blue collar workers are not (and shouldn't be) upwardly mobile. In fact, the pressures of high tech manufacturing and production techniques fall heavily on the blue collar workers, and it is the blue collar jobs that are most in jeopardy as we go through this transition to an information and service economy.

3. There is demand for non-credit on-site courses, workshops and seminars to which many colleges have been slow to respond. The demand is frequently not for "off the shelf" offerings but for a course tailored to meet a specific need. And when a company is experiencing a need, it doesn't want something promised six months later, after the curriculum committee has met and the Academic Dean has approved it and the faculty person has a lighter schedule.

4. There is in the business world much skepticism about what colleges have to offer. They have a stereotype (sometimes accurate) about courses that are out of touch with the realities of the contemporary business world, taught by faculty who treat adult students as though they were 19 years old and wet behind the ears. They see much that is irrelevant and dated and impractical in the content, and pedantic and time wasting in the process. This set of perceptions is hard to overcome and means that much time must be spent in building confidence.

The implications of the project for postsecondary education and business partnership include the following:

1. Any postsecondary institution interested in doing business with business should first look to its mission and its resources to determine if this is really a priority and if it has the appropriate programs, faculty and administration committed to its success.

2. Colleges should choose only their best faculty to teach off site, and make certain that they want to do it. Unwilling faculty make terrible teachers. Adult learners are fair but highly critical, and they recognize and will not stand for poorly prepared or out of date material and a condescending or inept pedagogical style.

3. Colleges must be prepared to be reasonably flexible when modifications of content or delivery are requested.

4. Colleges should be candid about what they can't do. They shouldn't take on contracts that will stretch their staff resources or that will compromise their academic integrity or that will cause more dissension on campus than they are worth.

5. Colleges should look beyond course delivery to see what other resources they have to offer. A few colleges have begun to offer on-site career counseling or prior learning assessment workshops. Others have done well with "Returning to Learning" seminars or simply by putting an academic counselor into an industrial plant a few days every year. An institution's relationship with the business community shouldn't be just a series of sources. They should be thinking beyond courses to cooperative research projects faculty/executive exchanges, internships, or consulting arrangements.

Relationships between the postsecondary education and business communities are a two way street. Business doesn't have all the money. Colleges don't have all the expertise. Both sectors are looking for rewards. They must work out win/win situations which will build the foundation for true partnerships that are on-going and mutually supportive. The EMO concept and its application through the BDTC show that education and work can be integrated to the benefit of all, organizations and individual employees.

"Technician Training for Women and Minorities" is a case study of the Intensive In-Plant Training program, a joint program of Rio Salado Community college and Motorola, Inc. The Intensive In-Plant Training program of Rio Salado Community College (AZ) had two major goals. The first was to train technicians to respond to the needs of one local electronics company (Motorola). The second was to provide a means of improved mobility for women and minorities who had not had the opportunity for advancement or postsecondary education and training.

Rio Salado Community College in collaboration with Motorola, Inc. developed a one-year Associate Science degree program, delivered at the workplace, to provide upward mobility opportunities for women and minority assembly line workers in the electronics industry. Technicians in this industry tend to be men while women have tended to fill the ranks of the assembly line. The objective of the program was to move more women and minorities into technician positions by offering a training (and college degree) program which has been adapted to the needs of the industry.

The Intensive In-Plant Training program provided the courses and services necessary to meet the requirements for an Associate of Science degree for either electronic or semi-conductor technician. Normally requiring two-years of full-time study, the 64 credit program has been compressed into one year. The program lasted for 52 weeks with participants in the program 40 hours per week. Courses were concentrated into a 5 week time period with classes meeting 3 1/2 - 4 hours five days a week. Courses met for the same number of hours as traditional programs but were scheduled for five weeks as opposed to 16-18 weeks. The program combined technical skills development.

A number of services were also provided to participants. A counselor from the college was available at the worksite one day per week for individual counseling. A group counseling session also was required once per week. One week prior to the start of classes, workshop were held on study skills, assessment testing, career awareness, and career development. Courses in math anxiety, self awareness, coping strategies, and team building were taught in the first weeks of the program to help participants overcome fears and anxieties and to ease them into the education/training situation.

All students accepted into the program in a given year went through the program together. Each class consisted of approximately 26 students who remained together for all classes throughout the year. The courses combined lecture and hands-on experience with computer assisted instruction used for tutorial assistance in electronics areas. All classes and laboratories took place at the workplace. All faculty in the technical skill areas were industry-based. Individual tutoring also was available to the students. Each course that comprises the II-PT program was developed with a standard description, specific objectives, and a set of specific activities to meet these objectives. Each student was tested to assess her/his ability to meet the objectives of each course.

Students were recruited from the ranks of the assembly line workers in the company. A posting system was used to recruit students with far more applying than could be accepted in any given class. Class size was kept to 20-35 per year. Applicants had two interviews which focused on background, skills, and "potential". In 1983, 280 applications were received for 35 program slots.

The Intensive In-Plant Training program met its goals of training technicians and providing a means of upward mobility for women and minorities. Ninety-eight percent of all applicants completed the program and 95 percent of the completers were placed in technician positions with the company. The average salary increase after program completion was approximately $2.00 per hour from $8.25 per hour as a assembly line worker to $10.00 per hour as a starting technician. In addition to the promotion from the assembly line to a professional level position with resulting raise in salary, the participants have an increased understanding and appreciation for the role of education and training in their lives. Approximately three-quarters of the "new" technicians continued their education and/or training after the program. This compares with only one-quarter of similar employees in the company.

The impact of the program follows the participants into their new jobs within the company. According to their new managers and supervisors, these new technicians were not only able to perform their new functions but were able to handle stress and manage their own time. In addition the participants had good interpersonal skills. The managers and supervisors attributed these social psychological outcomes to the nature and structure of the program.

The II-PT program has been successful at overcoming a wide array of barriers often faced by adult learners. Because all participant costs are covered by the company and salaries are maintained, employees do not suffer any financial burden. By offering the program on a full-time basis at the worksite to employees who are on payroll, the time factor is overcome as a barrier. Job responsibilities are eliminated (but not salary) while the participants are part of the program so this does not act as a barrier. The tutorials, support group, and counseling help participants overcome any lack of confidence they may have. Because all courses are offered during regular work hours there are no scheduling problems. The short-duration and concentration may remain a problem for some participants. All courses are relevant to the jobs being prepared for and the length of the program allows participants to complete it in one year. The one-year duration, however, may be too intense for some participants. Information on the program and counseling are provided to all participants to these are no longer problems.

The II-PT training program offers an example of a training program that has adapted to the needs of an industry and a specific group of employees who could not otherwise participate in such a program. This program offers training to a population group which does not seem to be adequately served by the more traditional adult education and training institutions. It is a program that offers opportunity for upward mobility and a college degree for a population of low skilled, low educated minorities and women.

As a result of a conciliatory agreement a partnership between Motorola and Rio Salado Community College was formed to design and deliver a one-year Associate of Science degree program. The partnership and resulting program provided upward mobility opportunities to women and minority assembly line workers in the company. Unfortunately the end of the program was also the end of the partnership. While both organizations had gained from the experience it was clearly a partnership that was formed for the purpose of this one program. As the program ended, so did the partnership. As the director of the program for Motorola stated, "if we continue the program we will probably move to another college to save money on facilities and improve the teaching." Rather than working with Rio Salado in a partnership to respond to these issues, it was considered easier to "just move the program." The II-PT program was developed through a partnership but the partnership was viewed as an objective nor outcome of the experience.

4. New Directions for Continuing Education Sourcebook

Toward the end of the project, the Project Director and the former FIPSE Program Officer edited a sourcebook in the Jossey-Bass, Inc. New Directions for Continuing Education Series. The sourcebook was based on the assumption that the integration of education and work, whether formal or informal, is critical to the survival of our nation's economy. And, because of demographic shifts and the aging of the population, it is imperative to the survival of the educational enterprise. The general purpose of this volume was to examine how postsecondary education can be responsive to the changing needs of industry and adult workers and to suggest how continuing education can develop and enhance programs that integrate education and work.

The first chapter sets a context for the sourcebook. It provides an overview of the economic, demographic, and technological changes facing the economy for the remainder of this and well into the next century. The resources which comprise the education and training system are then discussed in terms of new directions for continuing education programs that integrate education and work.

Chapters two through seven present case studies of six postsecondary endeavors that integrate education and work for groups as diverse as limited English proficient workers, rural adults, unions, small businesses, and a corporate park. In chapter two evidence is presented to prove that only when education and industry work truly together can effective English language (and other) workplace programs result. Through their case study of an innovative English language training program, the authors lay out three essential prerequisites to productive partnerships for integrating education and work programs: reciprocal benefits; complementary skills and knowledge; and effective working relationships.

Chapter three portrays the development of a computer integrated manufacturing education center to meet the needs of local industry for "super techs" who can install, program, and maintain high technology manufacturing and engineering equipment and systems. The program is designed around computer-based labs that simulate the operating environments of local industries. Through extensive partnerships with industry, that include donation of equipment, assistance in curriculum design, and training workshops, the program integrates education and work not only for recent high school graduates but for full-time employees in need of retraining, and manufacturing and engineering industries as well.

Chapter four examines the development and operation of an "educational maintenance organization" in a large corporate park. The case study of the Business Development and Training Center provides answers to the questions: what are the critical elements of the educational maintenance idea and how does it become a reality? The authors also explore what was learned about integrating education and work in the process of developing this new approach to education and human resource development.

Chapter five describes an integration of education and work that involves an educational institution working with labor unions to help combat problems of industrial dislocation and upheaval associated with foreign competition and new technology. The case study details an "economic literacy" project which provides a social, historical, and economic education to workers, giving them the tools to formulate strategies for charting their own economic future and help them analyze, revitalize, and retool their own industries.

As chapter six makes clear integrating education and work to provide computer education opportunities to rural adults can impact both individuals and communities. The case study examines the development of a computer literacy curriculum and its community-based delivery system. By providing computer, curricular, and human resources to local communities the project helps to foster local expertise in computer education and in leadership development.

Chapter seven argues the case for the increased importance of international markets to local economies and the staggering trade deficit that requires new business skills and strategies. Small and medium-sized businesses need to be trained in international trade if they are going to compete in the global marketplace. This case study describes the continuing education programs offered by the International Trade Technical Center. The Center integrates education and work related to foreign trade for businesses and their employees to increase awareness of the global economy, to facilitate exporting, and to develop new employment opportunities.

Chapter eight explores the lessons learned from the case studies. The authors offer a guide for continuing educators on new considerations and strategies for integrating education and work for working adults. Chapter nine presents a set of critical questions and issues for the consideration of continuing and other postsecondary education program developers, practitioners, and policy makers. This question and issue format is used as a lens for looking at future integrating of education and work. If continuing education is to adequately respond to changes in the flow and direction of the economy, new policies and practices need to be adopted which are responsive to the needs and demands of working adults, businesses, and communities.

5. The Education and Economy Alliance

Twenty-five projects made up the Education and Economy Alliance. A list of the projects is provided in the Appendix of this report. The Alliance met a total of six times over the life of the project. The activities of the Alliance included the following:

- Sharing of project information including successes, problems, and strategies.
- Review of policy papers.
- Identification of critical themes.
- Discussion of critical issues.
- Writing of policy papers.

The goal of the Alliance was to "make the whole more than the sum of its parts." The meetings allowed the participants to explore new ideas with "people they trust" and to gain new perspectives to be more effective change agents. A network was developed that helped each project do a better job. The Alliance explored a set of issues on partnerships, liberal education, and economic literacy that represent potential new directions for postsecondary education. While the team writing, that was a goal of the Alliance, was not a complete success, the discussions of the issues provided a great deal of information, and insight on new directions. The Alliance set an agenda for postsecondary education that each member will carry as they direct future projects and dialogue with other colleagues in the field.

On a personal note, the group of people who made up the Alliance were wonderful to work with and the experience was rewarding both professionally and personally.

Project Results

The results of the project are the papers and reports outlined above and provided in the appendix. They have been widely disseminated to the field.

No formal evaluation was undertaken because of the nature of the project. Overall, however, the project must be viewed as a success. The major problem centers around time. The Alliance members needed to have their time on this effort covered. While they participated in all of the meetings, the writing assignments took a back-burner to their own project direction. Each should have had five days per year set aside for work as Alliance activities, in addition to their participation in Alliance meetings.

Despite this problem, the quality of the ideas and of the products suggests that the Alliance project was a success.

The appendix includes copies of all of the products that were developed as a part of the Alliance project.

APPENDIX

Alliance Products and Reports

1. Demographic and Economic Changes and Postsecondary Education
2. Exploring New Concepts for Postsecondary Education
3. From Broad Strategies to Specific Ideas: Initial Thoughts of The Education and The Economy Alliance
4. Postsecondary Responses to a Changing Economy
5. Higher Education Partnerships: Practices, Policies, and Problems
6. Building Effective Business/Higher Education Partnerships for Economic Development
7. Higher Education and the State: New Linkages for Economic Development
8. Partnerships, Higher Education, and Economic Development
9. Economic Literacy
10. Liberal Education and Education for Work
11. Renewing Scientific/Technical Careers
12. Copies of the Eear Newsletter
13. The Business Development and Training Center: A Case Study of an Educational Maintenance Organization
14. English Language Training for the Workplace: A Case Study of the Language Working Program
15. Technician Training for Women and Minorities: A Case Study of the Intensive In-Plant Training Program
16. Responding to The Educational Needs of Today's Workplace
17. The Education and Economy Alliance

POSTSECONDARY EDUCATION
FOR A
CHANGING ECONOMY PROJECT

DEMOGRAPHIC AND ECONOMIC CHANGES AND POSTSECONDARY EDUCATION

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DEMOGRAPHIC AND ECONOMIC CHANGES AND POSTSECONDARY EDUCATION[*]

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Postsecondary education policies and practices are developed in response to a complex set of factors., As we have moved through the 20th Century a number of demographic and economic factors have changed. The interaction of these demographic and economic shifts is the force that has led to and will continue to effect changes in our postsecondary education institutions and system. These demographic and economic factors are discussed in terms of their trends and in terms of how a cluster of projects supported by the Fund for the Improvement of Postsecondary Education (FIPSE) have directly responded to them.

Demographic Shifts

The direction of changes in the composition of the U.S. population and in the composition of its labor force has direct and indirect consequences for postsecondary education policies and practices.

Aging of the population. Since the baby boom of the 1940's and 50's, the U.S. population has been aging. The 1980's and 1990's will see the baby boom generation move into middle age, and by the year 2000 the median age of the U.S. citizenry will be almost 35. An estimated 187 million adults 21 years old or older (an increase of 50 million over 1976) will comprise the population. It is not surprising that all of the FIPSE projects are concerned with the adult population. They represent the new group of students for postsecondary education today and far into the future. The projects are concerned with all types of adults, from young to old, and from those requiring basic literacy skills to those needing advanced scientific training.

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[*] This is one of a series of papers written as part of the Postsecondary Education for a Changing Economy: Resource Agent for Policies and Practices Project of the National Institute for Work and Learning. Funding support for the project was provided by the Fund for the Improvement of Postsecondary Education under grant number G 008440477.

More women in the paid labor force. The numbers and proportion of women in the paid labor force have been steadily increasing. It is estimated that women will comprise 65 percent of all new hires during the next ten years and half of the labor force by the end of this century. The READI project of the University of Idaho, recognizing this growth, has extended verbal, mathematical, and computer literacy training to rural adult women in Idaho. Adult women are one of the primary groups of learners served by the Rio Salado (AZ) Community College project which developed one-year AA degree curricula in a number of technological areas.

Increased numbers of minorities. The proportion of Blacks and Hispanics in the U.S. workforce has been steadily increasing. By the year 2000 these two groups together will constitute almost one-quarter of the workforce. This increased proportion of minorities has been felt by service organizations, elementary and secondary schools, and postsecondary education and training. In direct response to high unemployment rates among its urban minority population and the need for economic revitalization on its eastside, the Charleston (South Carolina) Higher Education Consortium, with the National Institute for Work and Learning (NIWL), developed the TECPLAY project. Housed in a neighborhood-centered Business Technology Center operated by Control Data Corporation, the project combines features of a neighborhood-based street academy (including a community-outreach person for recruiting and follow-up) with the operational control of the area's community college, the influential political and financial support of city government, and the credibility of location in a small-business "incubator" facility. These environmental factors are combined with computer-assisted basic skills and G.E.D. curriculum (PLATO system) and small group career development and counseling to provide the "hi-tech/high-touch" support structure so crucial for motivating disadvantaged youth.

Economic Shifts

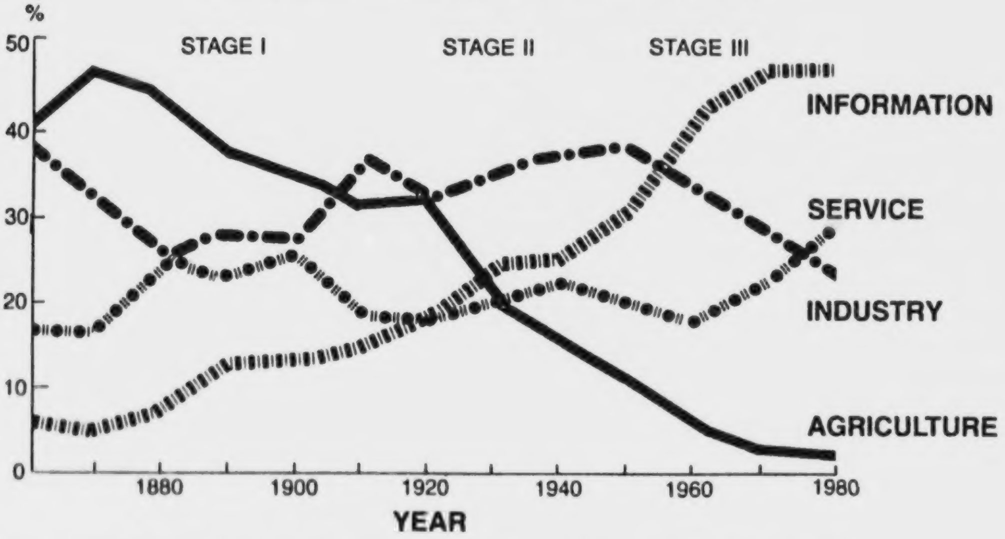
Major economic shifts and the resulting changes in the employment sector have occurred over the past two decades and further shifts are expected through the first quarter of the next century. Some of these shifts have been or will be dramatic while others will be more gradual. What we produce, how we produce, the way we work, and the character of jobs are changing and will continue to change. While the speed of these changes has clear implications for postsecondary education policies and practices, it is the changes themselves that will have the major impact on the future directions of postsecondary education. In addition to economic shifts, new applied technologies have affected every sector in the labor force. The high technology revolution is all around us: in the office and at the workbench; in our communication, transportation and health care systems; and in our houses. The growth of these technologies is sure to continue, but the implications for employment, social relations, education, and personal development are yet to be fully recognized. Questions that are being raised about the implications include:

- Will increases in computers result in greater free time for educational and leisure pursuits and are people ready to handle these changes?
- Will home offices and increases in cottage industries impact social relationships among adults?
- Will mid-career adult workers be forced to return to school or to be trained in computer related skills?

Growth of information sector. In the late 1950's jobs in the information sector, including the creation and transmission of information, became the principal sector of the U.S. labor force and the principal source of economic output. As the graph suggests, the growth of this sector has been continuous since the late 1800's. About half of all workers are employed in this sector and while the slope of the curve is expected to level off, due to automation and other technological advances, this sector is expected to remain the dominant employer into the next century.

The Four Sectors of the U.S. Labor Force by Percent 1860-1980

(using median estimates of information workers)



Source: Marc Porat, *The Information Economy: Definition and Measurement*, Office of Telecommunications Special Publication 77-12(1), May 1977.

A number of the projects in the cluster are providing education and training to prepare adults for the information sector. The verbal, mathematical, and computer literacy training provided by the READI project will help rural adults qualify for new jobs in the information sector. Boston College, through its seminars and counseling, and the University of Michigan, through its Employment Transition Program, provide workers in changing industries (manufacturing and industrial) with information about retraining and employment opportunities in other sectors, including the information sector.

The TECPLAY project, St. Louis Community College's Metropolitan Re-Employment Project, and Portland Community College's Small Business Development Center Model provide skills to individuals that will assist them in obtaining jobs or starting small businesses in the information as well as other sectors.

Service sector growth. As the graph also shows, the service sector surpassed the industrial sector in the late 1970's, becoming the second largest employer in the U.S. economy. Since most service jobs involve relatively unsophisticated, commonplace skills and knowledge, the service sector has always been the natural marketplace employer of last resort. The ready supply of displaced workers with limited employable skills will foster low wages in the service sector, and thus promote the general growth of service-related business. It should be noted that millions of people use service employment as a temporary transitional phase in their careers, while they acquire some form of retraining to qualify for work in more rewarding sectors of the economy. A number of the FIPSE cluster projects are providing information and skills to individuals for service sector jobs or for starting small businesses in the service sector.

Industrial sector shrinkage. The graph shows that employment in the industrial sector has been declining since the early 1950's, and the decline is expected to continue through the next decade. Due in large part to increased automation/robotization, improved operational procedures, and competition from developing countries with "cheap" labor costs, this sector is expected to employ only 11-12 percent of the workforce by the mid 1990's. The automobile, steel, clothing, and supportive industries have been affected by the growing trend of increased importing which has led to large numbers of displaced or dislocated industrial workers. Boston College, the University of Michigan, and St. Louis Community College have developed programs to respond to the needs of displaced industrial workers.

The Boston College project ties new training for industrial and manufacturing workers to an understanding of structural changes in technology and the organization of industry. The training is linked to economic revitalization in the region. The University of Michigan project offers a wide array of information and services to industrial workers facing displacement, including labor market information, skills and interest assessment, retraining information, educational information, support services, and peer support networks. St. Louis Community College through a partnership of business, education, labor, and government provides outplacement services to laid-off workers. Services include counseling, retraining, job search, interviewing, job information, and career planning. The project also provides services to businesses anticipating lay-offs. The NAPIC project fosters partnerships between Private Industry Councils and postsecondary educational institutions in six local communities to plan and implement job training programs for dislocated workers. At each site, services provided through the partnerships include labor market information, support services, or education and retraining for dislocated workers.

Boom in self employment. Self employment, which reached a low of seven percent in 1970, has been on the rise since then and is expected to continue to grow. The growth of the information and service sectors will reinforce this rise through information and service entrepreneurs. It is projected that self employment will double by the year 2000 from its low point of 1970. This growth is due, in part, to changes in other sectors. As mid-level, mid-career workers are laid off or not promoted they will be "forced" to enter self employment in new venture enterprises. The computer software and support industries are a clear example of this growing phenomenon.

The Portland Community College Small Business Development Center model, developed through a consortium of business, education, and government, is providing multiple services to small business entrepreneurs. In addition to an innovative curriculum in small business skills, the Center provides rental space for small businesses and office and support services. Small business entreprenuers are educated, trained, and assisted by the Center in developing their own small businesses.

Technology. Robotization, CAD/CAM systems, and other new manufacturing/industrial technologies are projected to eliminate 5-7 million jobs (mostly blue collar) before the turn of the century. Information/communication technologies, are expected to eliminate 7-12 million white collar positions. The total loss of jobs is projected to be between 15 and 20 million by the year 2000. At the same time, the production of these new technologies will create 2-3 million new jobs, while positions related to the maintenance and repair of these new technologies will generate an additional 4-5 million high technology service positions. Thus, the replacement of lost with new jobs is not projected to be one-for-one. The introduction of these new applied technologies into the workplace generates greatly increased demands for training and development in two ways: 1) displaced workers must be retrained for re-employability; and 2) employees who are provided with new technologies must be trained in their use.

A number of the FIPSE cluster projects have responded to this increased demand. The Boston College, the University of Michigan, and the St. Louis Community College projects are providing retraining or information on retraining for displaced or "at risk" workers. The University of Idaho is offering computer literacy to rural adults through its READI project. San Diego State University, through innovative refresher and updating courses, is offering educational upgrading to scientifically trained personnel in local high technology industrial firms. Late afternoon and evening postbaccalaureate certificate programs in Recombinant DNA Technology and Modern Analytical Chemistry are examples of state-of-the-art educational opportunities recently designed and now available for professional development to scientists in the community.

The New Hampshire Continuing Education Network involves businesses and industry in the active planning, decision making, and coordination of education programs in the state. Twenty-two colleges have joined together to offer education and training programs to workers both "on" and "off" campus. A request for proposal process was developed to provide information on the course or program being requested. Many of these were in new technology areas.

The New England Board of Higher Education is educating state legislators on the critical importance of higher education in responding to economic development based on high-technology industries and knowledge intensive services. The ultimate goal of the project is more enlightened financial policies developed by state legislatures in the future. Policies that will assist students, higher education R&D, and economic development.

Rio Salado Community College, responding to industry's needs for trained microprocessing technicians, developed a one-year AA degree program for women and minorities. The program combines technical skill development with general skill development and is delivered at the work-site by industry based faculty. Counseling and support services are also provided to participants in the program. Milwaukee Area Technical College worked closely with local businesses in developing their programs in Computer Integrated Manufacturing, Computer Assisted Manufacturing, and Computer Assisted Design. Four major project disciplines were initiated: industrial engineering, numerical control, computer science, and automated manufacturing. New competency based courses were developed as a result of the new partnerships with technological industries.

In setting the context we have looked at a cluster of projects which offer alternative postsecondary education responses to demographic and economic shifts. We have shown how these projects are models in themselves as well as examples for setting policy directions that offer innovative options (some new, some reformulations) for postsecondary education responses to the demographic and economic shifts discussed.

Postsecondary Education
for a
Changing Economy Project

EXPLORING NEW CONCEPTS FOR POSTSECONDARY EDUCATION

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EXPLORING NEW CONCEPTS FOR POSTSECONDARY EDUCATION*

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New strategies for postsecondary education must go beyond the adaptation of new innovative projects. While changes in different postsecondary education resources (content, modes of delivery, sources, and financing resources) are clearly needed to respond to future changes in the economy, strategies are also needed which try to span the boundaries of these resources or which try to connect them in more holistic ways. The strategies that are proposed involve processes or new partnerships. For each strategy a general discussion is followed by a set of specific project ideas. The project ideas are provided more as examples of the types of activities that could take place rather than as a comprehensive listing of possible new directions.

Meta-Connections Strategy

Partnerships and other connections between and among institutions and organizations have been around for a long time. A more comprehensive and permanent set of structural arrangements, however, needs to be developed. The concept of meta-connections is proposed to describe these new arrangements. Meta is used under its meaning "more comprehensive" and connection under its meaning "link—a means of communication and transport." Meta-connections refers to a more comprehensive link between postsecondary education, on the one hand,

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and other institutions and individuals, on the other hand, for the purpose of communication and transport of ideas, problems, programs, and strategies. Meta-connections should go beyond existing partnerships and collaborative arrangements in terms of services provided and connections among sectors. New bridging organizations may have to be created and new financing mechanisms identified.

Meta-connection strategies would need to bring diverse players, including teachers, learners, and administrators as well as representatives of different institutions, into an equal partnership in all aspects of the process, to offer a comprehensive set of services. The goal is to move beyond a piecemeal approach which offers one or two programs or types of services, to a strategy that allows for multiple services to be available to meet the needs of learners, businesses, or others in the community. Through such strategies a process could be put in place which would enable postsecondary education to develop a wide array of programs and services that respond to identified needs in an efficient and effective manner. More important, these strategies would offer a means of moving beyond a reactive position to one which is more proactive. By developing meta-connections between educational and other organizations, future needs and directions could be identified and postsecondary education resources proposed that could assist individuals and organizations in meeting these.

Meta-connection strategies might include an Education Maintenance Organization approach like that developed by CLEO in Philadelphia, or a statewide brokering mechanism like the Industrial Consortia Project developed by the New Hampshire Continuing Education Network. Another meta-connection strategy might be the development and implementation of a local human resource center which would gather, evaluate, and disseminate information on successful education and training approaches in industry and on the needs of adults for education and training. An adult learning library could be another meta-connection strategy which would offer video and audiovisual package courses and workshops to respond to the identified needs of adults and businesses in a community. A final example of a meta-connection strategy could be an adult learner brokering service which would connect adult learners with an array of postsecondary resources. A personalized learning program for the adult would be developed which utilizes the resources available from multiple postsecondary education resources in a community.

Meta-connection strategies may become more critical in the future as the need for education and training increases in order for individuals and organizations to keep pace with the changing society. Through meta-connection strategies postsecondary education can become a partner in the process of identifying and meeting critical education and training needs. These strategies also may help postsecondary education be more responsive to the changes being faced by individuals and the society by providing a brokering mechanism for matching education and training needs (business and individual) with postsecondary education services.

Homeo-Education

Increasing opportunities for postsecondary education and training in community and workplace settings should be fostered as the number of adults who want or need additional skills and knowledge to make job, career, or life transitions increases. It is important, however, to go beyond the mere offering of programs in these settings, although this is useful. The concept of *homeo-education* is proposed to describe strategies which use the environment for developing content and modes of delivery for postsecondary education and training programs. *Homeo* is used to refer to "a congenial setting" and *education* as "a process whereby adults undertake instruction/activities with the intention of bringing about changes in information, knowledge, understanding, or skills." Homeo-education refers to instruction or activities that take place in a congenial environment for the purpose of bringing about changes in information, knowledge, understanding, or skills.

Homeo-education may help postsecondary education identify and respond to the needs of business and learners and also help in determining future needs. By offering programs in workplaces and community settings, the postsecondary institution may better understand the culture and characteristics of the environment and offer services that are responsive to these in terms of both content and delivery. Homeo-education also may increase motivation of learners and of their communities because postsecondary education resources can be more responsive to needs and directions of the learner within the community. The setting for a homeo-education strategy may be a workplace or some other place in a community.

Homeo-education, at the workplace, as proposed here, has a number of basic elements. First, the program should be responsive to the needs of the business and its employees. The postsecondary institution may be useful in working with the business to identify its goals and needs. Second, the content of the program should be driven by the environment. In developing course or program content, postsecondary institutions should use materials, language, and values that are relevant to the workplace setting in which the program is being offered. Third, the mode of delivery should be responsive to the needs of the business and the learners. Experiential methods should be combined with other methods in a flexible sequence of activities. Instruction should be closely tied to the roles and responsibilities of the employees. Fourth, representatives of the business should be closely involved in the development and delivery of the program. Finally, the program should not be viewed as a one-shot activity but rather as a piece of a larger effort aimed at offering a wide array of postsecondary education services at the workplace. Homeo-education at the workplace can use the work environment as the guiding force in the development and delivery of postsecondary resources that are responsive to the current needs of employers and their employees and in identifying new directions for the future that are responsive to anticipated changes.

Homeo-education in the community has a parallel set of critical elments to those identified for the workplace. First, postsecondary education programs need to be responsive to the needs of the learners. Second, content should be learner-generated, aimed at responding to personal or community problems. Third, delivery of services should recognize the needs, culture, and experiences of the learner. Peer teachers, group processes, computer-assisted instruction, and experience-based learning are examples of methods that should be used to deliver programs. Fourth, representatives of the community and the learners themselves should be closely involved in design and delivery decisions. Finally, the program should be part of a larger effort that is aimed at providing a wide array of postsecondary education services in the community. Homeo-education in the community can be critical to postsecondary education's ability to respond to the basic skill and general education needs of adults. It can also be central to motivating adults to improve their skills by addressing issues and problems that are critical to themselves or their communities.

Homeo-education strategies might include a small business development center model like that developed by Portland Community College, or an adult literacy education project like the one implemented by the West Virginia Institute of Technology. Other homeo-education strategies might include: mobile educational services headquarter units that would bring a comprehensive set of services to adults in isolated communities and would work with the communities to identify learning needs and then design and deliver services to meet these needs; homeo-education competency assessment centers that translate diverse workplace and community education and training programs into a common set of competencies and develop new credentialing strategies using these competencies.

Homeo-education strategies may make postsecondary resources available to new populations of adults. By offering programs, in work and community settings, that are generated by the individuals in these settings, postsecondary education may become more responsive to the changing needs of individuals and institutions as they are affected by changing demographic and economic realities.

Strategic Planning

The central focus of strategic planning is developing a good fit between postsecondary education's activities and the needs and demands of the surrounding environment. Strategic planning would emphasize flexibility and quick responses to changes in the external environment. In strategic planning the following are continually assessed: the market for educational goods and services; trends in the local labor market and economy; demographic shifts; and the services that are currently available to respond to the surrounding environment. Under strategic planning no single plan would be developed but rather a stream of critical decisions would be made that help postsecondary education respond to its external environment and move into the future.

Strategic planning differs from conventional planning in a number of ways. These are outlined in the table below. The table also provides a basic set of guidelines that strategic planning should follow.

Comparison of Strategic Planning and Conventional Planning*

Activity	Strategic Planning	Conventional Planning
Arena of Planning	1. Relation to environment, organization's purpose and mission	Wide range of issues, nonroutine and routine
Who Plans	2. Top-level officers	Planning office
Time Orientation	3. Medium/Short range	Long range
System Perspective	4. External, environment	Internal, organizational
Theoretical Perspective	5. Open system, alternative and back-up positions developed, flexible	Closed system
Decision Data	6. Both quantitative and qualitative	Quantitative
Outcome	7. Stream of critical decisions, quick response	Plan, blueprint

Strategic planning can be used at all levels within the education system. The New England Board of Higher Education project is an example of strategic planning that is aimed at impacting state level decisions about the financing of higher education. Boston College and the University of Michigan are using strategic planning in developing and undertaking their projects for displaced workers. Each began by assessing the needs of these laid-off workers and the future of the labor market and local economies. This information was used to design the programs and services being offered to the workers to provide them with an understanding of the critical economic and personal issues that will affect their futures. The projects that are using a modular or flexiblesequenced curriculum are also responding to the needs of their external environments. Decisions on course content and methods of delivery are being made in direct response to the demands of the local environment.

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* Adapted from "Strategic Planning in Higher Education." AAHE Bulletin, October, 1982.

Strategic planning might also take place through an alternative instructional strategies board which could function within a postsecondary education institutional to encourage and support alternative instructional strategies, or a strategic planning resource center which could serve a local community and could be responsible for gathering information to assess the market for educational goods and services. It could also be responsible for generating decision options for the local postsecondary institutions which could then work together to decide on how best to respond to the identified needs of the local environment, selecting among the options generated.

Strategic planning could become more critical for postsecondary education as it responds to the needs and demands of businesses and adults. Postsecondary education decision-making may need to be more flexible and more rapid if the postsecondary education system wants to be able to compete with other providers of educational and training services. Strategic planning offers a means for accomplishing this end. It seems to be a process which can be useful at the department level within an institution, the institutional level, the inter-institutional level, and the state or regional level. As financial resources become tighter and as the population of traditional learners decreases and of non-traditional learners increases, postsecondary education decision-makers may need to be responsive to a "new" set of needs and demands, and strategic planning may offer a means of identifying and responding to these quickly and effectively.

In summary, if postsecondary education is to adequately respond to changes in the flow and direction of the economy, new policies and practices need to be adopted which are responsive to the needs and demands of adults, communities, and businesses. A set of new concepts for future strategies for postsecondary education's responses to economic change are proposed. The new concepts focus on meta-connections (a set of comprehensive cross-institutional/organizational linkages), homeo-education (education and training in a congenial setting), and strategic planning (developing a good fit between the needs and demands of the external environment and postsecondary education).

For postsecondary education to be responsive to the changing economy, it should look beyond its traditional role of education of youth (18-22 year olds) and its emerging role in retraining. It should be responsive to the diverse needs of a diverse society. Postsecondary education cannot work alone; it should work collaboratively with business, labor, government, and other educational organizations (all types at all levels). Postsecondary education cannot offer limited options; it should offer a comprehensive set of services to individuals and organizations. And, postsecondary education canot be concerned only with education; it should be equally concerned with learning—learning that empowers individuals and organizations to respond to and act on the changes they will be facing in the future.

POSTSECONDARY EDUCATION
FOR A
CHANGING ECONOMY PROJECT

FROM BROAD STRATEGIES TO SPECIFIC IDEAS: INITIAL THOUGHTS OF THE EDUCATION AND THE ECONOMY ALLIANCE

APRIL 1985

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FROM BROAD STRATEGIES TO SPECIFIC IDEAS: INITIAL THOUGHTS OF THE EDUCATION AND THE ECONOMY ALLIANCE

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In the earlier paper which explores new concepts for postsecondary education, we laid out three broad strategies for new directions on policies and practices. The Alliance has begun to develop two of these strategies into a set of more concrete ideas, themes, and central issues. Under homeo-education we have been exploring the place of liberal arts and general education in "education for work" and professional development programs. Our focus under strategic planning has been on economic literacy. What follows is a brief summary of the Alliance's initial thoughts in these areas. We have raised a number of questions and considerations for the reader.

Liberal Arts and Education for Work

In considering the role of liberal arts in "education for work" and professional development programs, the Alliance has begun to consider the following:

- Liberal arts skills for adult learners include communication, analysis, synthesis, decision-making, problem-solving, critical thinking, abstract reasoning, historical perspective, and cultural appreciation.
- The main concerns are how we teach (the process) and that content should be relevant to the goals of the learner.
- Liberal arts should be incorporated into the content of "education for work" and professional development programs.
- The classical model, as proposed by Bennett in his "To Reclaim a Legacy" report, is less appropriate to adult learners than a model which uses learner centered content as a vehicle for teaching liberal arts. One analogy that emerged from our discussion suggests that the classical approach builds a tower with the liberal arts as its foundation. The learner centered approach, on the other hand, is more like a balloon which fills with liberal arts knowledge and allows the learner to rise above specialization and land where she or he wants to. The former appears more rigid while the latter is flexible and

aware of the constancy of change. The former leads with breadth and depth and moves to specialization, while the latter develops breadth and depth through specialization. Both, however, are concerned with making the liberal arts meaningful in later life.

- Change in liberal arts for adult learners will come from "education for work" programs as opposed to liberal arts programs.

- Education needs to find out what businesses and workers need and want and then we need to experiment with new models. Involvement of top levels within organizations is critical to the success of any new models.

- New partnerships among postsecondary education, business, unions, government, and the community are needed to develop these new models in response to a number of questions including: How can work, job, and career oriented programs be used as vehicles for teaching critical thinking, abstract reasoning, and learning to learn skills commonly transmitted through liberal arts and humanities programs? What is the balance between liberal arts/humanities as a vehicle for preparation for work and "education and work" as a vehicle for transmitting general and liberal arts skills and knowledge?

Economic Literacy

Economic literacy is defined as the use of economic terms and principles to accomplish a goal within a specific context. In considering the dimensions of postsecondary education for economic literacy, the Alliance has begun to examine the following:

- Considerations of economic literacy are guided by the level one considers. That is, at the individual level the issues resolve around learning how the system operates so that one can earn a living and function in the economic system. At the organizational level the issues revolve around learning economic interchange so that the organization can be productive and function in the macro-economic system. At the societal level the issues revolve around learning economic interchange and how the system functions.

- There is a need to define a new set of competencies (economic literacy) to deal with changing employment patterns, workplaces, and economic systems.

- There is a need for a simultaneous process of assessing new definitions of the workplace and the education necessary to meet the needs of the workplace.

- Economic forces have caused postsecondary education to be reactive; how can a balance between reaction and pro-action be achieved?

- Postsecondary education should help individuals learn about such economic issues as entrepreneurship, small business, the information economy, rural development, global interdependence, decision-making, changing workplace, local economic development, and long vs. short range outcomes as they relate to individual, organizational, and societal levels.

- New partnerships are needed to develop answers to a number of questions including: What should be the goal(s) of economic literacy programs? What is the appropriate role for postsecondary education to play in relation to economic literacy and community level planning for and facilitation of economic development?

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The Alliance will continue to fine tune the issues related to liberal arts and economic literacy as well as explore other specific ideas that may emerge from our collective thinking about strategic planning, homeo-education, and meta-connection strategies for postsecondary education.

POSTSECONDARY EDUCATION
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POSTSECONDARY RESPONSES TO A CHANGING ECONOMY

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FUND FOR THE IMPROVEMENT OF POSTSECONDARY EDUCATION

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POSTSECONDARY RESPONSES TO A CHANGING ECONOMY*

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The Fund for the Improvement of Postsecondary Education (FIPSE) has supported a number of projects that are concerned with postsecondary education and the economy. Using the current twenty-two projects that comprise FIPSE's Education and Economy Alliance as a springboard, this paper focuses on postsecondary education's responses to changes in the direction and pace of the economy. We begin by exploring the common threads or themes that underlie the projects. The FIPSE projects are then discussed in terms of new directions for postsecondary education. We end the paper with a set of critical questions for postsecondary education policy makers and program operators.

COMMON THEMES

While the problems addressed and the solutions developed by each of the FIPSE Alliance projects differ, there are a number of common threads or themes that run across these efforts. These themes are critical to understanding the uniqueness of these projects in the context of other postsecondary education programs and practices. First, these projects are each responding to a problem or set of problems that is a result of changing economic (or demographic) realities. For some the situation is large numbers of displaced workers or workers in need of skill upgrading. For others it is the need for upgrading technological and scientific skills. Other projects are facing the situation of a lack of basic skills among a large group of adults, while some projects are responding to the need for increasing the human resource potential of employees within an industry or work setting. Finally, some are concerned with the issue of financing postsecondary education in the future and postsecondary education's role in economic or community development.

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Second, the population being served by these projects is adults, most of whom are or have been in the workforce. As such, these projects represent a new direction for many of the postsecondary institutions with which they are affiliated. For many of these institutions it is the first time that they are dealing with a population of learners who are mature, experienced, and looking for educational programs that are responsive to their needs for training, jobs, or self improvement.

Third, each of the projects is built on some form of partnership or collaboration among business, education, organized labor, local government, and/or community organizations. At its most basic level the partnership involves a single educational institution working with a single business, group of adults, or labor organization. At its most advanced level the collaboration involves multiple organizations working together to solve a problem.

Fourth, most of these projects are "on the margin". That is, they are either not part of a postsecondary institution or they are housed in offices or centers that are not part of the main curricular or educational units within the institution. They usually operate in whole or in large part on soft monies. They are usually on the fringe of postsecondary education programs.

Finally, the projects are primarily concerned with empowering people and/or organizations. Most of the projects focus on providing individuals or organizations with the skills and services necessary for career and life planning on the part of the individual and human resource planning by organizations. These skills range from basic literacy and advanced scientific training on one level and education/career development and human resource development on another level.

NEW DIRECTIONS FOR POSTSECONDARY EDUCATION

The FIPSE Alliance of projects offers some new approaches for responding to changes in the economy. These approaches effect changes at different levels and at different points in the postsecondary education system. Content, modes of delivery, sources, and financing resources are considered to be the resources that comprise the postsecondary education and training system. We first discuss how the FIPSE Alliance projects differ from more traditional or mainstream programs in general terms and then provide brief overviews of the Alliance projects. This latter discussion places each of the projects under one of the following three Alliance themes: partnerships (among education, businesses, labor, government, and community organizations) for basic skills and adult literacy; partnerships for professional skills and development; and partnerships for economic and community development.

Content of education and training is the variety of skills, knowledge, and understanding that individuals and the society need. It also includes support services for individuals and the community. While most postsecondary education institutions have a mission that dictates the content of their programs, new education content is constantly being created and incorporated into programs. Changes in demographic and economic conditions have effected parallel changes in the content of programs at many postsecondary institutions. For some, this change has meant being more responsive to the needs of local businesses, while for others it has resulted in new programs in basic skills, retraining, or skill upgrading for individuals.

Most of the FIPSE Alliance projects offer new approaches to curriculum/program content that respond to business and individual needs. These approaches differ from the traditional course content of postsecondary education in a number of ways. First, the content is often learner or employer driven. That is, the learner or the employer is an active participant in developing the content of the courses or programs. Second, the content is directly relevant to the life situations of these adults. Here we find content that is job specific, skill related, or in direct response to needs for support services including: counseling, information, educational advice, and financial advice. Third, the content is responsive to local and national economic realities. From small business training to understanding structural shifts in the economy, the content of these programs reflects current perspectives that are related to the economic lives of the adults who participate in them.

Each of the FIPSE Alliance projects has modified or developed new curriculum content to meet the needs of individual adults or of business organizations. From basic literacy to advanced scientific training, and from skill retraining to provision of diverse support services, these projects represent a set of new content approaches for postsecondary education that is responsive to the demographic and economic changes occurring in society. While the predominant mode of postsecondary education has been to follow a standard curriculum (in a given major), new educational content must be created if postsecondary education is to keep pace with the changing needs of society. These projects offer a set of models for changes in the content of postsecondary education and training programs that can be incorporated into existing programs or added on as a new program or area of service. At the same time, a process for identifying the types of job, intellectual, and self-management skills that are needed by adults should be developed. This process requires postsecondary education to play the role of an honest broker between adult workers and those organizations and individuals that influence workers' lives. As such we need to adopt a neutral stance, admitting what we don't know and stressing what we know in a process which involves the learners themselves in the identification of the content of education and training.

Sources of education and training are the institutions and organizations which offer postsecondary education and training programs and services (all categories). Three sources are identified. First are public and private institutions of higher education including universities, two and four year colleges, and vocational and technical schools. These are the traditional providers of postsecondary education and training and tend to serve the needs of traditional students (undergraduate and graduate). To an ever increasing extent, especially with the growth of two-year colleges, these institutions are serving other groups of learners including adult workers, retirees, re-entry women, and technical career oriented youth.

Second are corporate training offices and institutes. Corporate training offices offer formal and informal education and training programs to corporate employees. This internal training for new and existing employees usually involves skill (re)training, skill upgrading, management/professional training, or basic skills instruction. Training institutes also have been set up by large corporations to respond to specific needs for their workforce. These institutes can operate internal to an organization or external to it (separate entities set up by the corporation) or both.

The third source of postsecondary education and training is private skills training institutions and individuals. Associations, unions, consulting firms, service organizations, proprietary schools, and individual consultants can offer programs and services. Today, associations such as the American Banking

Institute, the American Management Association, and private training organizations offer more programs and have more "students" than all traditional postsecondary education institutions combined. Service organizations, like the "Y", community service agencies, and churches all offer a wide array of postsecondary education, training, and services. Through funds provided in collective bargaining agreements, cooperation with colleges and universities, and their own financial support, unions have created a variety of mechanisms to support the higher education of workers through financial subsidies and program delivery. Private proprietary schools offer specific training in specified skill areas such as secretarial, beauty/culture, dental technician, drafting, computer programming, and business. Finally, the growth of private consultants who offer training and other services to corporations, social groups, and individuals has been nothing short of phenomenal. From self help to speed reading, from career/life planning to specific skill training, private consultants are a growing source of postsecondary education and training.

A number of the FIPSE Alliance projects are concerned with making diverse sources of education and training available to adults and to employing organizations. These projects, through new partnerships between postsecondary education on the one hand and business, unions, community agencies, or governments on the other, recognize the need for making more than one source of postsecondary education and training available. Mechanisms to assist educational institutions in responding both cooperatively and individually to the needs of local businesses and other groups have been developed. Programs committed to creating and maintaining educational "health" and "balance" in the lives of individuals through the availability to the workforce of ongoing educational services of diverse kinds also have been tried by the FIPSE projects.

Modes of delivery are the methods by which education and training programs and services are made available. These include the method, timing, and location of instruction as well as the methods by which support services are delivered. On campus, classroom/lecture courses of one semester in length have been the predominant mode of delivery for higher education. While some institutions take the mode of delivery for granted, more and more institutions are varying this pattern in an attempt to respond to the needs of different groups of students. Developing new delivery systems is the area most affected by the FIPSE Alliance projects. Almost every one of the Alliance projects viewed new means for delivery of services as essential to the success of their efforts. These projects recognize that adults learn best in ways different than youth. They capitalize on the learning strengths of adults which emphasize the development of cognitive facilities calling for integration, interpretation, and application of knowledge, while deemphasizing the processing and acquisition of large amounts of new information.

Taken as a whole the FIPSE projects offer a set of new or innovative approaches to the delivery of educational services to adults. In addition to changes in the timing and location of offerings, new pedagogies and methods of instruction have been used to deliver services to diverse populations of adults. Much of these curricula is experience based, using direct hands-on experience as a teaching strategy. A number of programs are using computers to aid the instruction, while others use peer instructors to deliver the newly designed curriculum. It is clear that delivery is the primary postsecondary education resource that has been affected by postsecondary education's responses to changes in demographics and the economy. These new delivery systems have made postsecondary educations services available to an array of new adult learners across the country.

Financing resources are the fourth set of elements shaping postsecondary education's responses to education and training requirements of the shifting economy, and represent the public and private sources that finance postsecondary education and training. Included are public resources, corporate resources, and other private resources. Postsecondary education has traditionally relied upon public resources (to the institution or to the individual) and other private resources (donors, individual students, etc.) as its primary means of financial support. Recently, however, corporations have contributed to the financial pie through employment-based tuition assistance to employees; corporate training programs; donations of equipment and personnel; and R and D support. As the demographic and economic picture changes, new strategies for financing postsecondary education and training will be necessary.

A number of the FIPSE Alliance projects are directly concerned with new financing schemes for postsecondary education and training. One is working with state legislators to help them understand the relevance of economic changes to the financing of higher education. Regional policy briefings and state seminars are held to raise awareness and information levels of legislators on the vital issues of higher education and economic development. The project recognizes the critical importance of state legislators to the future financing and directions of postsecondary education and the importance of an information base that is built on new channels of communication between postsecondary education and state legislatures.

A second project is concerned with developing a new financing scheme for the support of educational health. Instead of the employer "client" paying a postsecondary educational "provider" a certain sum of money to deliver a given set of services—instructional or support in nature—employers join an organization that makes services available to members and their employees based on agreed upon goals and needs.

Other projects are using private industry and union resources for equipment purchase, curriculum design, tuition, and instruction. While most of these financing resources rely on private industry, a number of projects are trying to develop strategies for using state and federal programs to finance higher education. In the future these and other approaches to financing postsecondary education will be critical.

By looking at postsecondary education and training resources as the relationship between content, sources, modes of delivery, and financing, we have focused on new and innovative approaches to these elements that have been developed by the projects in the FIPSE Cluster. These new approaches center on a number of common factors. First, the recognition that new educational content needs to be continuously developing to be responsive to business and individual needs. Second, the major new sources of postsecondary educational services for adults include corporations and peripheral offices within the educational institutions that are separate from traditional academic departments. Third, methods, timing, and location of instruction have undergone the most dramatic changes. Interactive computer techniques, peer teachers, short flexible courses, hands-on experience and off-campus programs are rapidly becoming the norm of adult learning. Finally, new financing schemes for postsecondary education are being actively explored. From direct corporate support, to support through new federal and state programs, postsecondary institutions are identifying new sources of financing.

While changes in education and training resources have resulted from these projects, the recognition and development of partnerships and collaborations with other institutions and organizations are the most important new approach being used. Through these partnerships postsecondary education is better able to respond to the changes occurring in our society. Education joins with business, labor, and government to become partners in all aspects of the postsecondary education process from content and sources to modes of delivery and financing. These partnerships help develop forums for dialogues on critical issues central to the health of the postsecondary education system, the local economy, the national economy, and the nation's human resources. Each of the FIPSE Alliance projects is discussed in terms of such partnerships.

PARTNERSHIPS FOR BASIC SKILLS AND ADULT LITERACY

A number of the Alliance projects have formed new partnerships among education, business, community organizations, and unions to design basic skills and literacy programs for adults.

The English Language Training for the Workplace Project of Arizona State University represents a unique approach to the preparation and delivery of work-related educational services to adults. The project is developing an on-site language training program for industry. By participating in the program, workers who have difficulty using English will learn the language skills specifically needed to do their jobs effectively and will increase their potential for advancement in the company. To ensure relevance of the training program, the project staff is conducting a comprehensive needs assessment involving extensive on-site observation and interviewing. The project staff from Arizona State University is working collaboratively with a Phoenix branch of Honeywell, Incorporated, to pilot the program. In addition, representatives from local community colleges, adult education programs, and the business, industry, education council serve on an advisory board. The board is working with the staff to plan for an education-industry partnership that can provide job-related language training at a variety of local industrial sites.

The READI (Rural Education/Adult Development in Idaho) Project of the Idaho

Cooperative Extension Service and the University of Idaho is designed to develop a computer literacy program for rural adults that can be replicated in other areas. The project works with the State Cooperative Extension Service in designing curriculum and training as well as in networking resources. In addition, the project works with an advisory group to develop the program on a county level by training local resource people to teach the classes and by helping these groups identify ways technology can spur economic development. The classes feature the computer as a problem solving and management tool. This approach is useful to those participants who are seeking jobs or who operate small businesses, farms, or ranches. Thus, the project is working on developing educational strategies to meet the needs of people living in rural isolation, often with limited economic and educational resources.

The TECPLAY Project of the National Institute for Work and Learning and the Charleston Higher Education Consortium provided the seed funding for the staffing of a Fair Break Center located in a small business "incubator" building on the East Side of Charleston, SC. The Charleston Higher Education Consortium, acting as local project coordinating agent, assisted the City of Charleston, Trident Technical College, the Trident Work-Education Council, and City Venture Corporation in identifying areas of responsibility related to Center operations and involvement of neighborhood organizations, area employers, and other community resources. The project commenced in July 1982, with a local Fair Break Center providing a computer assisted program for upgrading basic skills and a comprehensive career development program. The purpose was to enable local residents of the urban minority neighborhood with high unemployment to compete for jobs being created in the area. When FIPSE funding ended in 1984, the local Private Industry Council funded the project with funds from the Job Training Partnership Act (JTPA). The Center is administered through Trident Technical

College.

The Applied Basic Skills: Education for Work Project of Jobs for Youth/Chicago teaches basic academic skills to economically disadvantaged out-of-school youth. The program links the workplace with the real educational needs of youth utilizing job-related educational materials to teach educational skills. The curriculum is integrated into the employment preparation and job placement/promotion functions of Jobs for Youth. Private sector employees participate in curriculum development and serve as volunteer tutors and instructors. The curriculum is learner-centered using employers training materials as the basis for teaching reading comprehension, writing, math, and other basic skills.

PARTNERSHIPS FOR PROFESSIONAL SKILLS AND DEVELOPMENT

Recognizing the needs of many individuals for skill upgrading and those of many organizations for increasing the human resource potential of employees, a number of the Alliance projects have formed partnerships for professional skill and professional development.

The Educational Bridges to Options in High Technology Employment Project of San Diego State University offers retraining and updating in biotechnology and analytical chemistry to about 100 mid-career adults who have a baccalaureate or higher degree in a scientific discipline and who completed their formal education over five years ago. This group includes some chemistry and biology high school instructors who are offering advanced placement courses at their institutions. The program makes it possible for already-working individuals to expand and improve their knowledge of the state-of-the-art and fosters professional development and career enhancement. Furthermore, these educational opportunities enable workers presently employed in positions that are becoming obsolete as a result of technological or economic changes to have wider options for seeking new jobs. The industrial scientists on the project's advisory board serve to strengthen the link between the University and the industrial community, especially in the high technology fields which are expanding in San Diego County.

The Business Development and Training Center at Great Valley Corporate Center (PA) is a cooperative venture of the Compact of Lifelong Education Opportunities (CLEO), Rouse and Associates, and the Benjamin Franklin Partnership of the Commonwealth of Pennsylvania. The Business Development and Training Center represents an entirely new concept of how business and higher education can collaborate for economic and human resource development. The Center brings aggregated learning, business development assistance, and training services on site to the employers and employees located throughout the Route 202 high technology corridor. The Center, which utilizes an EMO (Educational Maintenance Organization) model, similar to the popular HMO model, provides companies with an ongoing up-to-date educational program. The Business Development and Training Center offers credit and non-credit courses, workshops and seminars, customized job training, access to a network of consultants and professional services, career and academic counseling, testing and assessment of prior learning, opportunities for internships and work study arrangements, and networking opportunities for special interest groups.

The Upper Division BSN for RNs Project of The College of Staten Island of The City University of New York has as its principal goal the establishment of an educational model and delivery system that will allow working RNs to have access to and progress toward the Baccalaureate in Nursing (BSN). Students enrolled in the program must already be licensed Registered Nurses, who obtained their prior postsecondary education in associate degree or diploma school programs. The model will include: off-campus instruction at hospital work sites; non-credit instructional workshops to address the special needs of working RNs; designing special scheduling patterns to accommodate working adults with family responsibilities; and the establishment of a BSN Outreach Advisory Board of nursing administrators, labor organizations, nursing educators, and college administrators. Six hospitals are targeted for participation, four from Staten Island and two from Brooklyn, with 240 full time nurses expected to enroll in the program as matriculated BSN students.

The Graduate Professional Education for Information Specialists in an Electronic Age Project of the School of Communication, Information and Library Studies of Rutgers University is designed to assist in the development of partnerships between the School, corporations, and professionals for purposes of providing new educational programs for both practicing information specialists and graduate students enrolled in the School. Corporate and professional leaders will cooperate in identifying general educational requirements and specific skills needed to meet the growing demand for a variety of information specialists. The project incorporates seminars, colloquia, workshops, and the use of simulations as the means of developing and testing new educational modules and strategies.

The Cascade Business Development Center Project of Portland Community College offers small businesses a unique opportunity to establish themselves and grow in a supported environment. This facility will offer office and light manufacturing space to small businesses that anticipate growth and job creation. The space available is designed to be flexible in order to meet the facility needs of a wide variety of businesses. Below-market-rate rents will assist businesses in cutting their initial overhead. These businesses will be located in the incubator during their developmental period, up to three years. Many support services will be available to incubator tenants to help reduce overhead costs and provide high quality, professional services. High technology businesses also will have access to Portland Community College's laboratory and testing instruments and equipment which are located contiguous to the incubator. Equally important, each tenant will work with Portland Community College to design a management development plan, based on specific needs of his or her business. Classes, seminars, professional consultations, and related services will be included.

The Preparing for High Technology Careers In Computer-Integrated Manufacturing Project of the Milwaukee Area Technical College is training and retraining employees to enter high technology careers in computer-integrated manufacturing and is disseminating software and courseware nationally through established networks. The project identified skills needed by new or retained employees; developed a resource center; retrained the workforce; developed partnerships with industry; and developed new courses and programs. The population being served is in the greater Milwaukee area with an emphasis placed on retraining presently employed persons. Research was conducted to identify the skills necessary to work in the factory of the future. A steering committee of industrial and educational leaders guided the study of occupations. Specific task forces surveyed automated occupational areas and recommended new and modified educational programs. A computerized machining curriculum was begun as a new program in the fall of 1984. Extensive revisions were recommended in a number of departments including Industrial Engineering, Manufacturing Engineering, Numerical Control, Computer Science, and Electrical Mechanical.

The Associate Degree Program for Motorola Technicians Project of Rio Salado Community College trained 95 entry-level production-line workers selected by Motorola Incorporated to develop knowledge and skills sufficient to allow them to achieve the Associate in Applied Science Degree in Electronic Technology, and to allow them to return to the workplace at a higher level job. Nearly all students were women, including minorities, with no college experience. A variety of courses were offered, including mathematics, physics, chemistry, and basic and advanced electronics courses. Courses were held five days a week, eight hours a day, for one year. A variety of experiential learning techniques were used, including group discussions, laboratories, and competency-based training. Most instructors were adjunct faculty, and several electronic laboratory courses were taught by Motorola employees who became certified by the state to teach community college courses. All courses were taught at the Motorola training center in Phoenix, with the exception of chemistry, physics, and laboratory classes, which were taught at a technical college. Registration was offered at the work site, as were support services including: counseling, tutoring, test-anxiety assistance, and team-building workshops. Motorola provided classrooms, space for tutoring, and social activities as well as books, technical equipment, and instructors for the electronics laboratories. Students were paid regular salaries during their training; the company provided a graduation dinner and assisted with the placement of students.

The Industrial Consortia Project of the New Hampshire Continuing Education Network is increasing educational opportunities for adults throughout New Hampshire and assisting institutions in responding both cooperatively and individually to the needs of outside organizations or groups as well as of the individual adult learner. The Network sought not only to expand credit and non-credit offerings on campus, but also to expand programs at off-campus sites. Its efforts also included the development of industrial consortia across the state to expand training opportunities for business and industry. One of the major functions of the Network staff is to assist institutions in seeking out organizations, companies, and groups of individuals with specific educational needs and to assist in the delivery of courses/programs to meet these needs through one or more Network institutions. Twenty-two colleges joined together to offer education and training programs to workers at the workplace. A request for proposal (RFP) process is used to provide information on the courses and programs being offered and for the selection of the provider of services. The Industrial Consortia Project involves businesses and industry in the active planning, decision making, and coordination of education programs in the state. Initially much of the education/training requested by the businesses was at the basic skills level. As more organizations joined together to obtain training for their employees, the range of courses and programs became more complex.

PARTNERSHIPS FOR ECONOMIC AND COMMUNITY DEVELOPMENT

The third subgroup within the Alliance consists of a number of projects that have developed partnerships for local economic and community development.

The School for New Learning Graduate Program project of DePaul University is a three-year effort to develop and implement a Master of Arts program which integrates the skills and perspectives of the liberal arts with individually-tailored programs of study in various professional areas. It is designed for adults in environments characterized by change, turbulence, and value conflicts whose professional and personal needs are not met by traditional graduate programs. The program seeks to satisfy the increasing need in post-industrial America for practitioners who possess not only a high level of skills and knowledge in their established or emerging fields, but also a broader world view, professional vision and commitment to act on it. The curriculum of the program is informed by Mastery Criteria and consists of two parts. In the Professional area of Mastery the student, under the direction of a professional Mentor, focuses on the knowledge and skills specific to his or her professional area and uses the worksite as a learning environment. The Core Area of Mastery draws on the liberal arts to help the student address subjects, problems, and issues common to practitioners in all professional settings. Each student becomes part of a "Learning Cluster", an 18-member group which studies and learns together. Finally, every student designs and completes a major learning project, or "Master Work", which gives tangible evidence of the student's attainment of professional "mastery" and links the skills and knowledge of professional practice with those of the academy.

The Worker Education for the 1980s Project of Boston College and the Massachusetts AFL-CIO is a unique new program in worker education. It brings academic specialists together with local unions to help develop a response to the threat of unemployment that now hangs over the heads of workers in declining or rapidly changing industries. The project seeks to establish "preventative" labor education to anticipate the shockwaves that new technology and foreign competition will continue to generate through the 1990s in many industries. By preparing workers well in advance, through programs in the local union hall where long-term trends in the industry are discussed, workers take early steps to gain new skills required for the future. They also begin to play a more active role in making recommendations for changes in their own workplaces, jobs, and industrial sector. The collaborative project encourages participation in a new process where workers gain knowledge of and confidence in their own capacity to gain control both over their own future and that of their industry.

The Highlander Economics Education Project of the Highlander Research and Education Center is developing a participatory research and education process that will enable residents of rural Appalachian communities to deal more effectively with the impacts of the changing economy on their collective and individual lives. The project will do two things: develop models of cooperation whereby local higher education institutions and grassroots community groups can work together to meet community and individual needs resulting from changes in the economy; and develop an alternative economics curriculum to enhance the ability of rural residents to deal with changing economic development. The project is a three year program that will include: both participatory and traditional research on the changing national economy and its impacts on rural communities in Appalachia; the selection of a minimum of two communities and educational institutions in the region through which to develop the economics education program and models of cooperation; and the development, testing, and dissemination of an economics education curriculum for use within the region and elsewhere. Development of the project will be assisted by a regional advisory committee made up of representatives of institutions of higher education, representatives of grassroots community groups, and other community residents who have been involved in efforts to enhance economic development.

The Postsecondary Adult Literacy Education Project of the Center for Adult Education of the West Virginia Institute of Technology has developed a model for an adult postsecondary literacy development program using highly relevant materials in a workplace setting with adult worker groups. The project recognizes the importance of literacy for dealing with the economic problems of the region and the personal problems that have resulted from the larger economic problems. In addition to the use of community or work based materials, the model includes the training of adult adjuncts to continue literacy development in the group. Adult participants in the project receive literacy training in basic reading, writing, and computation skills through a group process that is centered around issues that are community or work related. Unlike many other adult projects, this one is based on the belief that the issue or message is what drives the worker or adult to learn to read or write. Rather than literacy for literacy's sake, the project empowers people by providing literacy skills and training for their own goals in their communities and workplaces. The project relies on adult adjuncts and peer pairing to deliver the program which is offered in rural communities, at union halls, and in prisons. The curriculum is experiential and learner-generated and the method of instruction relies on the issues as the delivery force behind the desire to learn. The impact of the project goes beyond the acquisition of literacy skill to the provision of skills that enable these adults to become participants in the economic and social life of their workplaces and their communities. It also helps local industries by improving the educational quality of their workforces.

The PIC/Higher Education Collaborative Project of the National Association of Private Industry Councils and the National Institute for Work and Learning fosters partnerships between PICs and postsecondary educational institutions so that higher education can play a visible and important role in JTPA through involvement in the local planning and implementation of job training programs, especially in the retraining of dislocated workers. Six SDAs (Northwest Pennsylvania; Franklin and Adams Counties, Pennsylvania; Chautauqua County, New York; Flint, Michigan; Columbus, Ohio; and Coeur d'Alene, Idaho) which demonstrated the willingness of one or more institutions of higher education to cooperate were selected to participate in the project. Activities at each site include at least two of the following: labor market information, supportive services, and education and training. Outcomes include better service provision to dislocated workers: education and training in skills identified to be in demand, pre-employment skills training, counseling and job search skills often provided by faculty members on campus or at the workplace. Benefits for educational institutions include resources to update curricula and equipment; and for the PICs, the ability to utilize the expertise of faculty for assistance in program and policy planning, labor market analysis, and other areas of need.

The Employment Transition Project of The Institute for Science and Technology of The University of Michigan is aimed at increasing the probability of reentry into the labor force and/or acceptance to retraining programs for displaced workers. The project has the following objectives: 1) increasing labor market information; 2) increasing training-related information; 3) increasing self-esteem; 4) increasing information about one's own interests, skills, abilities, and values; 5) reducing barriers to decision-making; 6) increasing information and skills in job-seeking; 7) reducing stress and anxiety; 8) promoting the identification of existing formal and informal supports, the development of more supports, and the skillful utilization of these systems; 9) increasing problem-solving and goal-setting skills; and 10) developing excellent resumes and high levels of interviewing skills. The core of the program is a five-day, 30-40 hour training study circle workshop offered to displaced workers. Training modules have been developed to respond to each of the ten objectives cited above. The modules are of two types, informational or skill building, and focus on self assessment, labor market information, career planning, problem solving, goal setting, and self marketing skills and products. A study circle approach is used for the workshops. This involves a cooperative learning situation with an interactive educational approach to acquiring the information and skills critical to informed choices of available options. Through this approach, an internal support group is built as the participants learn the skills and knowledge necessary for making informed choices. Participants in the program have learned to recognize the power of information. They understand its importance for decision making, they learn how to gather timely information, and they learn how to effectively use information to their advantage. Participants are better able to make decisions about reemployment and retraining options.

The Experienced Workers Re-Training Program of St. Louis Community College/St. Louis Metropolitan Re-Employment Project involves a local partnership of business, education, labor, and government to provide outplacement services to assist employers and workers affected by structural changes in the local economy. The program "helps people to help themselves" toward gaining new employment through the provision of services that assist displaced workers. The project offers a variety of services to both workers and local employers including: counseling, job information, job placement, retraining information, outplacement workshops for employees, pre-layoff assistance, and on-the-job training. The Job Shop training workshop, which is one of the major components of the project, focuses on resume preparation, job search techniques, interviewing techniques, and preparation of letters of application. The project also offers a placement service for employers by providing them with a list of qualified applicants (with resumes) in a timely fashion. Laid-off or soon-to-be laid-off workers also receive counseling on a one-to-one basis to assess their needs, strengths, and employability skills. These workers are not always economically disadvantaged and most have never had to cope with the psychological and financial effects of unemployment. Most have not had to look for work or consider retraining before. Participants, as a result of the project, recognize that they must take responsibility for their own life transitions, and have used the services available to help with these transitions. Participants are learning job search and interviewing skills and some are retraining for new jobs. The project has also improved relations between the college and business sectors in the community with training programs being developed that are more responsive to business needs.

The Evaluating Non-Collegiate Sponsored Instruction Project of Vermont State Colleges offers a new approach to business and education partnerships.

Through evaluations of employer sponsored instructional programs, a more active and behavioral approach to partnerships will be developed. These evaluations will bring education and business together to stimulate postsecondary institutions and employers in developing long-term, balanced relationships—relationships in which the career training expertise of business and industry is recognized and contributes to colleges' abilities to provide vocational preparation for its students; relationships in which colleges' expertise in intellectual development contributes to the vitality of the workforce. The evaluation of non-collegiate sponsored instruction is the first step in fostering meaningful educational collaboration between the firm sponsoring the training program and Vermont's postsecondary institutions. After each evaluation, a report is submitted to the firm which indicates, in the opinion of the evaluation team, the exemplary features of the training program and those areas needing improvement. A project staff person is designated to work with the firm in planning future educational endeavors. This usually means helping firms explore collaborative programs with area colleges that offer similar training. The project functions as an educational broker within Vermont and is able to utilize the resources of the public and private colleges in this regard. The project can also help the firm to improve the quality of its in-house instruction, or to find a college that will integrate the training program as part of an associate or baccalaureate curriculum. As a result the project offers a "free agent" service of the entire postsecondary system and serves as a "broker" between business and education.

The Public Investment In Higher Education: A Program for New England Legislators Project of the New England Board of Higher Education is aimed at increasing New England legislators' awareness of the importance of higher education to the region's economic development. Legislative understanding of the issues related to the financing of higher education is necessary to sustain the region's economic recovery, which has been influenced greatly by research, development, and the efforts of skilled graduates. This project is meant to focus on higher education, the critical resource of New England, and how it can be improved for the benefit of all. To this end the project strengthens communication between the region's institutions of higher learning, its legislators, and its industries, which education must serve. Major activities for the project include six state seminars for the legislators, each adapted to the needs of the individual states, semi-annual briefings for New England legislative leaders, and quarterly advisory council meetings. Information is disseminated through brief, data-based, policy-oriented publications designed for the legislators. The project more comprehensively linked legislators to a working coalition of leaders in higher education, business, and labor. The policy briefings held in each New England state engage a wide variety of legislators both in participation and in thinking about where higher education stands today, where it is going, and why it is important to economic development in this region and the nation.

Critical Questions

By way of conclusion, the authors raise a set of critical questions for consideration by policy makers and practitioners as they plan future strategies for postsecondary education's response to economic change.

As the demographic and economic pictures continue to change what will be the changing set of skills, information, knowledge, and attitudes that adults will need? How can the content of education and training be responsive to the shifts that are anticipated? The FIPSE Alliance projects represent a growing number of postsecondary programs that are providing a wide range of content of education and training. Basic skills and remedial courses are being offered in and by corporations in increasing numbers. Adult Basic Education and Adult Literacy programs are also on the rise. At the same time two and four year colleges are offering basic skills programs to adults. Will these programs, offered at the workplace, in the community, and in postsecondary institutions, have to grow as more adults are found to have inadequate basic skills preparation to meet the challenges of the future?

Postsecondary programs in job skills (vocational, retraining, and upgrading) have also been on the upswing. As new technologies have been developed, and as sectors of the labor force have been impacted by economic shifts, industries and individuals are in need of new skills. Postsecondary programs offered through all sources have been responding to this need for new job skills. Within the FIPSE Alliance half of the projects offered new programs in skill development, retraining, or upgrading. How can postsecondary education better anticipate these changes in order to be proactive in its response to the nature and pace of the economic changes throughout the remainder of this century and well into the next? If the nation's human resource is to keep pace with technological shifts and economic changes, will more programs for retraining, upgrading, and skill development have to be made available to broader populations of adult workers?

As new technologies are developing and as sectors in the labor force are changing, it is predicted that managers and professionals will need new skills and knowledge in diverse areas ranging from skill-related, to entrepreneurship, to human resource planning. What will be the appropriate role for postsecondary education in professional skill upgrading to keep pace with technological and economic shifts, and in management skill development to be responsive to the changing nature of the workplace and the adult worker? In order to keep pace with changes in technology and the economy, our human capital must be "modernized" in parallel with current initiatives to modernize and better utilize our other resources but the roles and responsibilities of business, postsecondary education, government, and individuals have yet to be worked out.

Through a number of the FIPSE projects, outreach, counseling, and information services are being made available to diverse groups of adults. As the economy continues to change will there be a need for increasing such services, and, if so, is the postsecondary education enterprise the most appropriate institutional base for providing personal and family counseling and information on: the structure and dynamics of the local labor market; education and training opportunities; new technologies; human resource planning and development; projected supply-demand imbalances of human resources; changes in economic structures; and changes in economic structures? How can postsecondary institutions work with other organizations to provide those support services that may be needed in the future?

A few other questions related to the content of postsecondary education and training should be considered in response to changing realities. First, as the population ages and a larger proportion faces retirement, what role will postsecondary education play in offering programs and services to this segment of the population? Clearly, some persons will need to be trained or retrained in order to continue to earn a living (or to supplement retirement income). Others will need vocational or avocational programs as they are faced with increased amounts of free time. Are approaches which integrate these learners with learners of other age groups better or does this population require its own set of offerings?

Second, the role of general/liberal/humanistic education in a changing economy needs to be examined. Should postsecondary education take the lead in refocusing the nation's attention on the importance of this category of education in the years ahead? Should programs on humanities and business, liberal arts and technology, critical thinking, etc, be developed as viable and necessary alternatives to existing approaches? What is the role of liberal and general education in "education for work" programs? How can work, job, and career oriented programs be used as vehicles for teaching critical thinking, abstract reasoning, and learning to learn skills commonly transmitted through liberal arts and humanities programs? What is the balance between liberal arts/humanities as a vehicle for preparation for work and education for work as a vehicle for transmitting general and liberal arts skills and knowledge?

Third, what is the appropriate role for postsecondary education to play related to economic literacy and community level planning for and facilitation of economic development? Should postsecondary institutions take the lead in developing strategies in these areas or should they be participants in a process started by other organizations?

Finally, as new management approaches call for increased worker participation in decisions, is it necessary for programs to be offered to adult workers that provide them with "critical thinking" skills appropriate to these new roles? Also, as individuals are faced with increasing job and career changes will they need more programs that provide skills and opportunities for decision making based on reliable information?

Sources of postsecondary education and training are abundant, and diverse. As the labor market continues to change in response to demographic and economic shifts, these sources of education and training should become more responsive. Will new programs be needed as more workers are displaced or as more move into the information and service sectors of the labor force? Will postsecondary education need to look closely at the other sources of education and training to fill in gaps in programs, adults served, and services offered? How can the more traditional providers of postsecondary programs recognize the magnitude and importance of the "shadow" education system and develop partnerships to reduce overlap, redundancy, and competition in an attempt to better serve both adults and employers?

Are new sources of education and training needed in the near future or can better use be made of existing opportunities to respond to the changing economic and social realities facing the nation in the next quarter of a century? The FIPSE Alliance projects offer a number of examples of how diverse sources of postsecondary education and training can be integrated to meet the changing needs of adults, businesses, and communities.

Different modes have long been used to deliver postsecondary education and training to adults. As changes in the economy affect postsecondary education, will increased reliance on alternative methods rather than on one or two be necessary? In addition to the traditional learning approaches of lectures or small group lecture/discussions, other approaches should be explored.

Can new approaches to scheduling, course structure, timing, and pedagogy offer postsecondary education and training opportunities to larger numbers of adult learners? Some of these alternatives are employed in the FIPSE Alliance projects. Use of new technologies such as teletext, teleconferencing, interactive video, and computers can also offer learning approaches to wide audiences of adult learners. How can postsecondary education and training institutions be made flexible in their delivery of programs to learners? New experiments and demonstrations that use alternative strategies to deliver information, knowledge, and skills to learners should be tried. Unless the traditional providers of postsecondary education and training are willing to offer alternatives to the standard approaches, they may lose out to other providers of postsecondary education and training who are willing and able to offer almost any course or program at almost any time, almost anywhere. As individuals and organizations are responding to changes in technology and in the economy they will want to move quickly and efficiently and will want delivery systems that get them there.

Will the future parallel the present with regard to financial resources for adult learners? Can combinations of resources be used to finance postsecondary education and training or will corporations provide an increasing proportion of the financial resources in the future? It seems safe to conclude that corporations should be expected to pay their fair share for the postsecondary education and training of their employees, but other resources will be needed to support dislocated, re-entry, and other adults. How can more programs like those offered through the FIPSE Alliance projects be developed to support training for dislocated workers? Should states and localities follow the lead of many of these projects and offer tuition-free programs to dislocated adults, and will it be necessary for federal and state governments to look at new strategies for financing postsecondary education and training in the future? If increasing numbers of adults will be required to continue their education and training to remain employed, what new means of financing their participation will be necessary? Can postsecondary education stand back and wait for these resources to emerge or will it have to take the lead in looking for alternative answers to the question of who will pay for the education and training needed by individuals, institutions, and the society in general?

A number of critical questions concerning the content, delivery, sources, and financing of the postsecondary education enterprise have been raised. The answers to these questions that are developed by policy makers and practitioners will set the future direction of the enterprise's responses to economic change.

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POSTSECONDARY EDUCATION
FOR A
CHANGING ECONOMY PROJECT

HIGHER EDUCATION PARTNERSHIPS: PRACTICES, POLICIES, AND PROBLEMS

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HIGHER EDUCATION PARTNERSHIPS: PRACTICES, POLICIES, AND PROBLEMS*

I. WHAT MAKES THE NEW PARTNERSHIPS DIFFERENT?

When we talk of partnerships (or collaboration) between higher education and other organizations, do we mean anything different from the exchanges of goods, services, and ideas with which we are already familiar?

In a world in which no individual or organization is self-sufficient, exchanges of one sort or another are the incessant ebb and flow of daily life. Universities purchase food, computers, books, and other goods from companies. Businesses hire college graduates as employees and faculty as consultants and may purchase licenses to university-owned research. Some unions negotiate faculty contracts while other unions represent different groups of college and university employees. Academics, employers, and employee representatives mix their interests while serving on boards of trustees and advisory committees. Colleges and businesses and associations, because they bring jobs and budgets with them, are sought by politicians and other citizen groups who want them to locate in one or another state or community. In thousands of ways all these people help themselves by helping others, exchanging a part of their time, energy, funds, or expertise for some resource provided by others.

Why then does the rhetoric of the new partnerships and of collaboration raise hopes and fears quite different in character from the emotions and expectations related to the routine purchasing, selling, and interacting that go on daily among the sectors of our society?

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By new partnerships or collaboration we mean the joint ventures between higher education and other organizations (particularly the business sector) that are characterized by: voluntary institutional participation; multi-sector leadership, problem-solving, and performance-based orientation; shared or complementary interests; and shared responsibility for agenda planning and action. But is this new partnership just another name for patterns of institutional behavior that have been with us for a long time? Or are the patterns themselves changing and in the process forcing us to create new behaviors and new ideas to guide those behaviors?

First, we can readily admit that in many respects the future is but an extension of the past. Certainly in the United States, with its diversity of public and private colleges and universities, many of them founded and supported through close relationships with business and industry leaders, there has been little ideological basis for separatism between the institutions of work and learning.

Nonetheless, the concepts of institutional collaboration and partnership do imply changes in both style and substance affecting these relationships in some basic ways. In style, projects we designate as partnerships and collaborations imply a greater degree of collegiality, openness, and commitment to shared values than would be typical of an exchange relationship. We do not use the term collaboration to describe a contract under which a company provides food services, maintenance services, or computer services to a college. But "collaboration" seems just the right word to describe a project to develop a new computer assisted manufacturing process or to help employees learn English as a second language. Here both the college and a "partner" such as a union or a company assist in the effort. It is not collaboration when a company or a government agency contracts with a university to survey employee needs, conduct archeological assessments in advance of new road construction, or design the reorganization of a department or office. Yet "collaboration" seems to fit the situation when university and contractor, with or without external funding, work together on organizational effectiveness research, develop guidelines for employee needs surveys, and share personnel and task responsibilities in carrying through the work. The closer we look at the situations we call "partnerships" and those we do not regard that way, the more we see partnerships and collaboration as dominated by collegiality and shared responsibility across institutional boundaries in the performance of substantive tasks.

In substance, projects and programs we designate as partnerships and collaborations imply a breaking or at least a temporary minimizing of the boundaries that normally separate organizations. Rules regarding the sharing of information or the qualifications of certain personnel or the scheduling of certain activities are bent if not changed. The more rules are bent and exceptions made, the greater we feel the influence of the collaborative style.

Style and substance merge. In this breaking of rules the participants experience, to varying degrees, a sense of adventure and exhilaration. Collaboration and partnership become words which imply a feeling of synergy, of extra energy, and imagination applied to a program.

Thus what we call collaborative activities are different. They create situations in which decision-making authority over the design and operation of certain missions and functions of an organization is shared with "outsiders." This threatened sharing of authority is what makes collaboration risky as well as challenging and exciting. The organization's norms of leadership and control are questioned. The job has to get done. The organization needs to prove itself, to show that it can do the job. But it cannot do the job by itself. The opportunity and responsibility must be shared. This dilemma strikes at the emotional and pragmatic gut of an organization. All the more reason, one concludes, that the benefits of partnership programs should far outweigh their costs.

Throughout this paper examples of higher education partnership efforts are provided. The majority of these examples are taken from a group of projects which comprise the Education and the Economy Alliance, a program supported by the Fund for the Improvement of Postsecondary Education, U.S. Department of Education. (For more information on any of these projects, contact the National Institute for Work and Learning.)

II. THREE CATEGORIES OF PARTNERSHIPS

Partnerships between postsecondary education institutions and work organizations directly challenge the ideal of the autonomous university or college. In the face of declining youth enrollments, growing control by public agencies and state legislatures, and increasing costs that cannot be passed on to consumers, postsecondary education institutions look to partnerships with corporations and unions as one way to help balance sources of revenues, political pressures, and student enrollments. From the model of faculty and institutional autonomy, the modern education institution shifts to a model of multiple power centers of students, government, business, labor, and other groups as external forces with faculty, administrators, and boards of trustees in higher education performing a balancing and integrating function at the hub of the postsecondary education enterprise.

Three Categories

Essentially partnerships and joint, or collaborative, activities involving postsecondary education institutions with employers, unions, professional associations, and other groups may be said to trade in three types of resources:

ideas, wealth, and people. In well-planned projects these three resources reinforce one another. These three types of resources play dominant roles in three corresponding types of partnership activities (see Johnson, 1984):

- Joint research partnerships are built on the production and development of ideas and concepts. Basic and applied research potentially leading to new and profitable products can be a highly rewarding basis for education-business partnerships, especially in scientific and engineering fields.
- Economic development can be defined as the creation of new wealth through the use of money, markets, manpower, materials, and management, the "five M's" of economic development theory.
- Human resource development can be interpreted in either the more narrow, utilitarian, economic development sense of investing in people to make the most productive use of their talents or in the broader humanistic sense of enabling people to develop their individual talents for their own sake.

Each of these broad categories has many varied specific incarnations. Each category has its own sets of strategies for successful partnerships. Each has diverse programs and outcomes. Yet, the three can be related. Bridges can be built from one type of partnership with its goals and programs to the other two types of partnerships with their goals and programs. A joint research project, for example, can also be developed to train a new generation of researchers or to build the conceptual basis for a project with economic development implications.

Similarly, activities in these three areas can be pursued at various levels of cross-institutional involvement. Johnson (1984) describes three levels of interaction between academic and industrial (or business) organizations:

- Least interdependent are academic activities oriented toward business. This level includes research centers and institutes established on a unilateral basis by postsecondary education institutions, publication and speaker programs oriented toward business audiences, and professional curricula serving business purposes.
- Academic activities in cooperation with industry require more sharing of resources and responsibilities. These may include: personnel

exchange programs, research consortia, contract research, adjunct faculty, advisory committees, cooperative education, extension services, consulting relationships, and development of industrial research parks and small business "incubator" facilities.

- Academic/industrial partnerships are defined by Johnson (1984) to include such activities as cooperative research centers, joint planning and program councils, and cooperative entrepreneurial development projects.

The more specifically we describe a project the more difficult it becomes to categorize the project neatly by level of involvement.

The broad sweep of collaborative possibilities can be suggested, however, by the identification of some sub-categories of such projects. Closer examination of substantive topics possibly deserving of multi-sector attention also points to some of the problems inherent in the practice of partnership developments.

Research Partnerships

Corporate research tends to be skewed toward the development of marketable products. Academic research tends to pursue the goal of new knowledge regardless of its commercial value. Between these two main tendencies are many points of overlap and separation. Many ideas produced in universities enter public use and discourse through publications and teaching without ever becoming the basis for formal collaborative projects. And much of the thinking, research, and teaching in colleges and universities is shaped by major events and issues in the world outside. At the same time, each sector has its own separate culture where direct contact with outsiders may never occur.

Partnership activities, therefore, tend to favor those parts of their respective institutions having the most similar interests and methods and having the potential to provide mutual rewards. Inevitably this skewing of focus raises questions about the integrity of academic and professional practices, including the freedom to select topics, to pursue ideas wherever they seem to lead, to publish findings freely, to discuss research ideas with peers and students, and to move unhindered from one institution to another.

In recent years many of these "principles" have become negotiable because of the growing similarities between the roles of researchers in industry and those in academic settings. Theoretical knowledge in many technical fields is finding quick absorption into applied knowledge. Theory is being developed more rapidly under the pressure of challenges in product development. The closing gap between theory and practice in technical fields and even in many social science fields such as organizational leadership, decision-making, and political science is triggering an era of good feelings among corporations, unions, and universities that was largely unforeseen and even unwanted two decades ago.

Typical of these science and engineering research partnerships are:

- Monsanto and Harvard University - research on biochemistry and biology in organogenics.
- Bristol-Myers Company and Yale University - production of anticancer drugs.
- The Standard Oil Company of Ohio and Stanford University, the University of Pennsylvania, Pennsylvania State University, the University of Illinois, and MIT - research on offshore engineering, crop genetics, and mining technology.

Corporate interest in state-of-the-art research in areas other than science and engineering has extended primarily to business-related specialized topics in organizational psychology (for insights into leadership and supervisory behavior), communications theory (for command and control systems used in defense and multi-national corporations), and general management theory. In Search of Excellence and other landmark studies, for example, have been the result of joint research projects initiated by either university faculty or management consulting firms. In these business research projects as in the sciences, partnership projects and the opportunities they bring for individual involvement tend to be limited to the elite public and private research universities.

Not yet a widespread occurrence but with the potential to reach into a wider range of colleges and universities are examples of research on topics of regional and community interest involving colleges and universities with regional and local constituencies. Here business sponsorship tends to emphasize analysis of regional economic, demographic, and political trends on the one hand, or the development of research programs closely linked to industries (for example, ceramics, or automobiles, or construction) with a strong presence in the region.

Labor unions have had almost no role thus far in these research partnerships, with some very modest exceptions involving state universities with strong programs of labor studies or industrial relations. Professional engineering and scientific associations have played a modest yet important role in raising corporate attention to concerns such as the shortages of engineering faculty and in encouraging the development of education-corporate partnerships through reports, publications, presentations at annual meetings, and the formation of associations dedicated to cooperative education.

What appears to be lacking in these research partnerships is serious attention to potentially controversial areas in which corporate performance in matters affecting the public welfare might be subjected to pub[illegible] criticism. Issues such as disposal of chemical wastes, affirmative action, occupational safety and health, plant closings and worker displacement, and investment in overseas production facilities may affect corporate profits and products in direct, occasionally spectacular ways. Yet corporations, or unions for that matter, tend not to seek out joint research projects on these issues. Foundations, government, and public interest groups tend to be the sponsors of college and university research on these topics.

Opportunities for research partnerships also are directly affected by national and state laws dealing with tax, anti-trust, and patent policies. Fears of anti-trust prosecution have inhibited the formation of industrial consortia sponsoring university research projects in the past. The financial value of a research project differs if it is treated as a philanthropic contribution from a corporate foundation than if it is treated as a depreciable or tax creditable investment in corporate research facilities. In recent years some of the main legal barriers to partnership programs have been removed. With those barriers eliminated, some of the advantages of campus-based research environments, especially for consortia-type research, have emerged. The more open-ended, exploratory atmosphere of the campus, the greater credibility associated with research findings produced in the "neutral" campus environment, and easier access to inexpensive yet highly motivated student research assistants all favor collaborative campus-based projects once negative factors are removed.

In sum, joint research partnerships encourage participation in a relatively narrow band of intellectual topics and appeal to individuals who are committed to a specific scientific or engineering research topic. Such persons may also be relatively sympathetic to corporate interests in developing products based on the research. Researchers -- whether employed by corporations or universities -- who are involved in topics of public controversy or topics far removed from product development seem to be less likely to become participants in education-business research partnership projects.

Economic Development Partnerships

Partnerships between higher education and business for economic development are changing and increasing (see Doyle and Brisson, 1985). Economic development partnerships have three faces:

Community development refers to planning and implementing projects and programs to improve the economic and social qualities of life in a whole community or geographic area. Gains in individual or institutional wealth are assumed to contribute to overall public welfare. A new college campus, a new office of a government agency or of a private employer, a new factory, a new museum, or the upgrading or expansion of these, are actively sought and developed by public and private interests for the additional jobs, tax revenues, and consumer spending they can be expected to bring to a community and region. Part of this expected value may be more indirect: for example, the expectation that the presence of one organization may attract others, whether as suppliers, competitors, or simply as neighbors constituting a core for economic growth. The Economics Education Project of the Highlander Research and Education Center (TN) is an example of a new partnership for community development. The project is developing a participatory research and education process to enable residents of rural Appalachian communities to deal with the impacts of the changing economy on the economic and social qualities of their communities. Models of new partnerships between local higher education institutions and grassroots community groups have been developed. A new economics curriculum for local community development is also being developed.

Institutional development involves a more self-serving analysis and utilization of the organization's own resources. In recent years, for example, colleges and universities have more carefully analyzed their real estate holdings and other real estate parcels in their vicinities. Reflecting on the successes of Silicon Valley near Stanford University, the Route 128 corridor near the research and engineering schools of the Boston area, and the Research Triangle in North Carolina's university research center, colleges and universities are placing new and higher values on their regional investments, their faculty, and their physical resources. Even universities that do not aspire to national status better understand the attractions of the campus research environment for businesses involved in knowledge production. Institutional development involves new ways of identifying the tangible and intangible assets of the institution and finding ways to capitalize those assets and market them to potential partners. An example of a partnership for institutional development is the Model CAD/CAM Training Center at the Milwaukee Area Technical College (WI). The CAD/CAM Training Center offers software and training materials in "Computer Integrated Manufacturing" for retraining industrial workers. As part of the Center, a microcomputer-based CAD system was developed. The system has been sold to educational institutions and a dealership network has been established.

Business development includes elements of both community and institutional development. The aim here is to grow new enterprises or to assist older ones. Sponsoring entrepreneurial "incubator" centers and venture capital funds for small businesses, or organizing small business assistance centers (perhaps with state or federal government funding) may have community development as a primary purpose and institutional development as a secondary purpose. The method chosen is clearly that of improving the chances of business owners to achieve product development and marketing success. This is in some contrast to the emphasis of community development on building an infrastructure of public services and core employers which supplies the economic "yeast" for self-generating growth. And it is also in contrast to the emphasis of institutional development on the comparatively narrow self-interest of a specific organization. The Small Business Incubator Project of Portland Community College (OR) is an example of a partnership for business development. In addition to offering low cost rental space to small businesses, the project provides support services, classes, seminars, and professional consultations to the prospective entrepreneurs. Businesses can remain in the incubator during their developmental period, up to three years, after which the project assists with relocation for ongoing operation.

Education-work partnerships can be used to generate development projects, or partnerships can be nurtured and generated as a result of effective economic development projects.

As with research partnerships, economic development projects frequently depend on government funding or tax policies as a sometimes active and sometimes silent partner. Interest-subsidized revenue bonds, for example, may be more easily justified in public policy rhetoric if a university or similar non-profit research organization is a sponsor of a project and is likely to be a major beneficiary of the public subsidy. Urban Development Action Grants (UDAG), Community Development Block Grants (CDBG), and other direct payments from governmental programs can be used as incentives for collaborative projects. Federal and state training monies from vocational education and Department of Labor training programs are used in many states to build programs of job training partnerships among community colleges, employers, unions, and other community-based education and training organizations. Some states, Massachusetts and Pennsylvania, for example, have created state-funded programs which require matching contributions and collaborative agreements between employers and education institutions before state financial support is provided. Finally, the largest incentives for college partnerships with employers and unions may be through tax-financed student grants, loan guarantees, and subsidized tuition rates at public institutions.

The incentives for economic development partnerships are many and varied. Full understanding of these varied incentives, of the financial savings that can be built into programs serving different institutional and community needs, and of the ways programs can be marketed to different audiences in business, labor, and the public sector can be an important factor in determining the success of partnership programs.

Human Resource Development

The life of every working adult is a kind of informal partnership between education and work institutions. A career with a steady flow of income is the implied reward that follows from educational preparation. Individuals must draw the connections by making career choices, selecting educational programs, earning income to pay for education, searching out a first and successive jobs, learning on the job, and using the career advancement network to move from position to position.

Many corporations have their recruiters. Colleges have their placement offices and cooperative education programs, as well as their continuing education programs. Nonetheless, collaborative partnerships for career development are as underdeveloped and as open to innovative possibilities as are the research and economic development programs currently attracting leadership attention. Gradually, employer, union, and education leaders are recognizing opportunities for programs that formalize explicit relationships between performance at work and performance in education.

Put in terms of career progression, human resource development partnerships can be categorized as:

- Entry-level preparation and orientation
- Technical skill development and maintenance

- Career transition preparation and skill enhancement
- Career completion

Entry-level preparation and orientation: Instructional programs at most colleges and universities are dedicated primarily to preparing young students for their first major transition from education to work. Whether the goals of study be liberal arts, sciences, engineering, technician skills, legal or medical studies, few students would attend undergraduate, graduate, or professional degree programs without career preparation as a primary motivation. At first glance, education institutions ought to be expert in understanding and shaping the subtle and complex relationships between intellectual training, skill training, and career transition planning.

In recent years entry-level preparation by postsecondary education institutions has come to include remedial education in basic skills presumed to have been taught during elementary and secondary education. Some corporations and unions have contracted with postsecondary education institutions to provide basic skill training to their employees or to develop basic skills curricula for adult learners. The English Language Training for the Workplace Program of Arizona State University provides English-as-a Second-Language training to employees of Honeywell's Large Computer Products Division. The program uses an innovative "functional" approach to language training. The curriculum deals with language in a comprehensive way including grammar, pronunciation/intonation, spelling, communication strategies, style, and culture. The aspects of language skills are always presented with content drawn from the work environment at Honeywell.

In other instances, universities and colleges have become involved in collaborative projects with employers, local governments, unions, and others to improve the effectiveness of elementary and secondary education. Sharing responsibility for the design and effectiveness of the entire education system may lead to new ways of incorporating the traditional liberal arts core of the undergraduate curriculum into pre-occupational training. In many communities, making these changes from the traditional role and content of postsecondary education institutions has required collaborative business-academic leadership.

Technical skill development and maintenance have long been a higher education function. These activities range from the summer executive seminars for alumni and corporate top managers to the skill training of associate degree or certificate programs. The rapidly growing training function within corporations is the catalyst for greater use of contract training and long-term "retainer" training relationships. Employment-based tuition assistance programs have become a mainstay of many continuing education programs at nearby colleges and universities. On the basis of these two sources of employer funding -- training and tuition assistance -- specific degree and non-degree programs can be developed. The Special Technician Training Program of Rio Salado Community College (AZ) has trained production line workers of Motorola, Inc. in electronic and semi-conductor technology. Participants are given paid leave for one year with all tuition costs covered by the company. The community college has designed a one-year Associate in Applied Science degree program with courses held five days a week for eight hours a day. Upon completion, participants are placed in electronic technician and semi-conductor processor positions within Motorola. The contract between Motorola and the community college includes provision of a training center, technical equipment, and cooperative education experiences for students.

Similarly, collaborative opportunities abound in the development of programs and research supporting the career transitions of adult workers and of retiring workers. Whether these transitions are initiated voluntarily or involuntarily by the individual, employers are assuming more responsibility than has been the case historically for the financing and planning of personnel changes. An outplacement industry of consultants is being created first by difficult economic conditions and second by a fundamental restructuring of the "social contract" between employer and employee. As researchers, as consultants, and as traditional providers of career counseling and training, postsecondary education institutions still have much to learn about the educational needs of adults facing occupational and economic transitions. But their position is no different from that of employers, unions, professional associations, and adults themselves who are also moving quickly into uncharted territory. With these uncertain times and the anxieties of many workers is coming a strong compulsion for lifelong learning: the need to have multiple skills and experiences simply to make career change less risky. Better understanding of the dynamics of career change can itself be a basis for the development of partnership programs.

Summary

Collaborative partnerships between postsecondary education institutions and work institutions are essentially of three types: research partnerships intended to produce and develop ideas; economic partnerships intended to produce and develop wealth; and human resource partnerships intended to develop people. Within each of these categories are many different opportunities for substantive projects linking education and work institutions. But the likelihood of actual project initiation and the scale of resources allocated to specific activities are influenced by many factors and problems. Collaborative activities tend to develop around substantive issues where common interests are strongest. These common interests may engage only small aspects of the collaborating institutions. Moving beyond the margins of prestigious areas of collaboration requires persistent creativity, persuasion, and solid performance.

III. WHO COLLABORATES?

Who participates in collaborative projects? Each partnership activity has a ripple effect on the politics and personalities of the institutions involved. One must ask in each case not only if the respective organizations benefit, but also who else benefits.

Some understanding of the organizational conditions for collaboration is essential to an understanding of who collaborates and who benefits from collaboration. The basic factors involved can be described from four perspectives:

1. The perspective of organization mission: Are the style and substance of the collaborative program consistent with the organization's sense of its own identity?
2. The locus of the initiative within the organization: What are the effects on those involved and those not involved?
3. The level of leadership directly responsible for the collaborative initiative: What powers of position and resources are brought to bear in support of the program?
4. The depth of institutional involvement in the program: Are the activities restricted legitimately to a small corner of the organization or are the opportunities and rewards widely distributed?

Effects of Mission

An organization's mission, its sense of main purposes, has much to do with the projects it selects for collaborative programs, the types and size of resources devoted to these programs, and the selection of people to be involved. Computer firms prefer programs and projects that advance the sophistication, quality, uses, and reputations of computers. Insurance firms also look to ways of enhancing their products, including economic and community development activities that enhance the value of real estate properties in their investment portfolios. Labor intensive businesses and labor unions seek ways of enhancing the quality of the labor force, particularly as it affects the quality of entry-level workers, supervisors, managers, or skilled labor. The Honeywell English Language Training Program and the Motorola Special Technician Training Program are examples of how an organization's mission determines the nature of the partnerships entered into with institutions of higher education.

Similarly the missions of education institutions establish the direction of their partnership interests. Research universities such as Yale, Harvard, or Rutgers look primarily for partnerships which enhance their reputations as innovators on the cutting edge of new knowledge in fields such as pharmaceuticals, business organization, or ceramics. Other universities and colleges (or other departments at the same institutions) seek partnerships which enhance their reputations as innovators in applied research and producers of quality professional workers. Liberal arts colleges seek partnerships enhancing their view of the world, seeing themselves as producers of creative managers and pre-professionals. Community colleges draw on their several missions: as providers of lifelong learning to adults entering new careers, as producers of quality entry-level technical workers, as providers of remedial learning to employees lacking skills, and as sources of technical assistance to local small business.

The Education Bridges to Options in High Technology Employment project of San Diego State University (CA), the College of Staten Island (NY) Upper Division Bachelor of Science in Nursing (BSN) project, and the School for New Learning graduate program of DePaul University (IL) are examples of how the mission of the education institution can dictate the nature of its partnerships. The San Diego State University project offers retraining and updating in biotechnology and analytical chemistry to mid-career scientists for professional development and career enhancement. The project responds to the school's mission of serving the expanding high technology industrial community in San Diego County. The College of Staten Island project provides a means for working RNs to have access to and progress toward the BSN. The program responds to the college's mission of meeting the educational needs of working adults and the human resource needs of the health and social service deliverers in New York City. The DePaul University project directly responds to the School for New Learning's mission of offering innovative experiential liberal arts programs to working adults. This Masters of Arts program integrates skills and perspectives of the liberal arts with individually-tailored programs of study in various professional areas.

Thus, an organization's mission in many direct and subtle ways stereotypes the reputations of the people who work for it, both enhancing and restricting the opportunities available to them for collaborative action. Even so, the experience of American colleges, universities, corporations, and unions over the past few years appears to indicate that all these institutions have seriously undervalued the resources they bring to the partnership negotiating table and underestimated the variety of profitable opportunities for collaboration among education and work organizations.

Employer organizations and unions tend to undervalue the learning that occurs daily on the job. Consequently they often neglect ways of improving workplaces as learning environments. Work organizations are only beginning to understand that the spirit of self-initiated learning and problem-solving can be nurtured and combined with techniques of training and formal instruction as important aspects of business success. As workplaces become better organized as learning environments they will also become more attractive partners for colleges and universities trying to show connections between theory and practice.

Similarly, postsecondary education organizations have not viewed themselves as the owners of franchises on important aspects of research, knowledge, and instruction. Organizations are established and maintained only at great cost. Once established their presence tends to ward off the establishment of other similar organizations. State boards of higher education may explicitly limit competition by preventing other institutions from developing competing programs.

Businesses and labor organizations have long appreciated the power of such "franchise" positions. Unlike large and wealthy corporations able to seek out information and expertise anywhere in the nation or world, the typical employer, union, or student must look closer to home. Education institutions, while thoroughly experienced in exploiting their geographic proximity to high school graduates, are frequently naive in exploiting that same proximity to other organizations.

The language arts faculty need not be of national stature in order to provide top quality instruction tailored to the needs of nearby managers and industrial workers. The economics department can develop a strong reputation locally as a source of regional economic data and analysis without expecting to compete with major university researchers in the pages of professional journals. The mathematics, science, business, and language departments, by paying more attention to the economic and demographic characteristics of the region's employers, may be able to develop special expertise in areas of research, scholarship, and instruction that will bring national or international fame while also attending to matters of immediate import in the region. These opportunities and possibilities are inherent in almost every collaborative relationship.

Serious development of education-work partnerships should strengthen the diversity of American postsecondary institutions. Better understanding not only of their own strengths and weaknesses as isolated institutions but also of the strengths and weaknesses of the communities, regions, and other organizations within their reach should result in more sophisticated understanding of organizational missions and identities. This deeper understanding should lead in turn to more creative uses of joint ventures between education and work organizations. For example, the nation's elite research universities are working more actively then ever before to capitalize on their "franchise" resources of expertise and prestige (including joint research projects, research park and real estate developments, community action programs, and even summer sports camps). Other educators following these examples will come to see the opportunities for partnerships that can be found in their own backyards. The Milwaukee Area Technical College microcomputer CAD system discussed earlier is a case in point.

Locus in the Organization

At first blush, the problem of location within a given organization of a partnership project or program must appear obvious. Of course a new genetic engineering partnership program will involve a few key academic departments and one or more of the few firms with expertise in that field. And of course the new automotive technician program sponsored by the local automobile dealers' association will benefit the automotive specialists.

Programs in each of the three categories of partnership activities tend inevitably to benefit those responsible for organizing and directing the programs. Publicity, possibly prestige, job security, and professional opportunities may accompany the project.

But the location of a program can work in opposite directions. Most partnership efforts are small, tentative explorations of new ways to provide services, solve organizational problems, or develop credibility and trust across organizations. Ventures that have the blessing of high university and corporate officials may be viewed suspiciously or merely negligently if not given appropriate attention and resources. Ventures lacking higher endorsements face all kinds of obstacles of attitude and administrative practice unless the entire organization is accustomed to the nurturing of innovative programs. Such innovation-nurturing organizations are rare.

In this broad analysis, therefore, location of a partnership program activity can elicit two types of effects: rewards or difficulties. In either case a special entrepreneurial outlook will be required on the part of the individuals responsible for the project or program.

Over the years most faculty have learned to live with the fact that certain specializations and professions have greater opportunities than others for external consulting and the income and visibility that such activity provides. Within departments accommodations are made for the star performers. To the extent that these activities bring additional funds, students, research opportunities, and prestige to the institution, the faculty and departments involved often find ways to claim special rights and treatment in dealing with other department and campus administrators. Depending in large part on the mix of personalities, the internal politics can be either ferocious or diplomatic.

Collaborative activities of a low-key nature, small in scope and involving only a few faculty, can have much the same impact within a college or university as a consulting relationship. But the relationship takes on a different quality and significance once an official institutional involvement is suggested. The first projects may be smaller and less noteworthy than a faculty consulting project. But the intent, even the mere possibility of developing longer term relationships with one or more external organizations raises the "ante" and introduces new factors affecting faculty participation. Similarly in a corporation or union, the individual project of a subordinate manager or official takes on different meaning if it represents the direction toward which higher level officials may want to move the entire organization.

Therefore the process by which chief executives -- whatever their organization -- or other policy-making officials reveal or hide their intentions and review and select partnership opportunities makes an enormous difference in the ways these activities are perceived and supported by others in the organization.

At times it is advisable to minimize the impact of particular projects on an organization. The special exceptions made to permit the project to accomplish its goals are specifically rejected as precedents. In other cases it makes sense to develop formal organizational policies and to support an activity as an example of the type of initiative desired.

Some times it makes sense to stress the ways in which the entire organization benefits from the side effects of a particular project and to establish special committees to oversee the activity, learn from it, and seek additional ways to involve others. At other times it makes sense to protect a project from too much attention, whether to protect a limited budget or to protect a politically sensitive project activity. The considerations are multiple. Yet from a strategic viewpoint, every collaborative project should be assessed on how its present location in the organization can best be used to touch and inform the lives of other members of the organization, and how its presence can be used to enhance and perhaps give new meaning to the central mission of the organization.

Level of Leadership

The question of who collaborates in education-work partnership projects and programs also must be answered in terms of the level or levels within an organization at which the partnership activity is initiated. Major differences in style and substance of partnerships are affected by the relative differences in power, prestige, resources, and visibility associated with different levels within organizations. These differences frequently determine who gets involved and in what ways.

Yet it is doubtful that a top level activity is inherently "better" than a lower level activity. Successful and influential partnership projects can be initiated as readily at the junior staff level as at the presidential level. Too frequently people assume that top level support is essential, an assumption that raises expectations yet may result in greater disappointment when success does not follow obediently the commands of those leaders.

Success and quality are functions of wise management (and good luck) at any level, built on a proper use of the levers of control available to those directing the collaborative effort. The impact of organizational level on program quality and success requires, therefore, some discussion of the available levers of control at each level. For purposes of this brief discussion, two generalized "levels" will be analyzed: "top level" initiatives and "lower level" initiatives. The intent of the comments that follow is to approach each organizational level objectively and without pejorative connotations. Different situations can make either level the target of opportunity.

Top level leaders, for example, tend to be very sensitive to failure. A leader knows that he or she has a limited stock of credibility. Many demands are made to tap that limited stock of decision-making opportunities. Consequently, the typical organizational leader wants ideas to be tested, to have all the risks identified and taken into account before decisions are made about the worthiness of a project or the amount of resources to be invested in it. Such thinking tends to err on the side of cautiousness.

Small, peripheral projects with which the leaders of organizations have little or no direct contact can play crucial roles in the development of partnership programs by testing and cleansing ideas of their more outrageous and ineffective features. Thus the interplay between top level and lower level initiatives is essential. Rapid progress and enthusiasm for partnership programs develop in situations where participants at the different levels of an organization understand and consciously employ the techniques of interaction between high level and lower level initiatives. Where chief executives and staff do not communicate, do not understand the opportunities and ploys available to them, or even disagree and work at cross purposes, partnership initiatives at any level are more likely to encounter frustration and failure.

Top level initiatives: The involvement of top level officials in a collaborative education-work project usually implies the making or anticipation of a decision related to one or more of six factors:

- a major investment of financial resources;
- a major shift in institutional mission (or the decision to reject a proposed shift in mission);
- a major change in organizational practices;
- a major personnel change;
- a major public relations opportunity to represent the organization and take credit for some out-of-the-ordinary accomplishment; or

- a major political move to assuage, or reward, some individual or group.

In other words, the involvement of top officials in a collaborative project probably has little to do with the substantive content of the project itself and far more to do with impact of the project on the organization. Dear though the topic may be to the leader's heart, the development of a new computer assisted design program, the retraining of displaced workers, or the enrollment of assembly line workers in a technician level degree program must take second place to the question of whether or not the proposed activity will enhance the survival, continuity, and growth of the organization in a constantly changing world.

Because individuals differ in their judgments regarding how innovative activities will serve to enhance or detract from an organization's mission or reputation, decisions about collaborative activities can be controversial. Support from the chief executive usually means that the organization's resources -- its monies, personnel, reputation, and allies -- either will be enlisted in support of a project (throwing the weight of the organization behind the project) or at least will be kept in a neutral position, allowing the project to prove itself without undue interference. But the very fact of top level support may arouse sources of hidden opposition. People who might have ignored a project operating modestly under the direction of a junior professor or manager will pay close attention to the same project if it appears to have the blessing and interest of the top executives. Is the project a harbinger of things to come? If it were expanded, what would be the implications for the standard ways of doing things? If made permanent, who stands to gain, and who to lose? Would basic research be shifted into university laboratories? Would managers and union officials be accepted as adjunct faculty? Would affirmative action programs be taken more seriously?

In a word, projects can quickly become politicized once the top officials of an organization are involved. Sometimes politicization helps a project by setting policy or intimidating the informal opposition, those persons who delay actions and raise objections and generally undermine the ability of a project to perform. Sometimes politicization hinders project performance by making potential opponents more aware of the significance of the project's goals and practices, of the people the project proposes to serve, and of the points at which the project is most vulnerable to criticism.

Top level involvement in collaborative projects, therefore, is most justifiable when the skills and resources associated with an organization's top leadership are most in demand and can be most useful in practice. Of these skills and resources, credibility is the most important. The endorsement of top officials, their commitment to the goals of a project, their word that a project is of genuine importance to the mission and future of an organization, can carry enormous weight with funding agencies and prospective partner organizations and key personnel. The details of what is meant must be worked out according to the situation, of course. But the initial commitment to a project from top officers puts their credibility on the line and affects how seriously their commitments will be viewed in the future. Because it is preferable to avoid spending one's credibility, leaders generally prefer partnership projects that can manage on their own to find funding and produce desirable results without leadership involvement. The leader's skill and status are saved for other days and bigger deals.

In addition to their credibility as leaders, that is, as people with the capacity to assure that things get done, top level officials are presumed to control resources. Smaller projects make relatively modest claims on an organization's resources. Larger projects, by stepping on more toes as it were, make larger claims: they need more attention from central administrative units, are more likely to require special dispensations from certain rules, and are more likely to make one group of people in the organization more noticeably enviable than the other groups. Leaders get called upon to balance these diverse interests and to assure an equitable distribution of rewards, or to rationalize the inequities in ways others accept as reasonable.

Involvement by top level officials is also necessary when changes in organizational mission are required. This frequently requires shifts in resources. The ability to shift mission and resources is entirely beyond the abilities of lower level staff.

All these strands of credibility, resources, and mission come together in the collaborative event made to order for the top level leader: the big deal. It may have been planned well in advance. Or it may be an opportunistic idea, casually mentioned over drinks or dinner with a fellow top level leader. The follow-up discussions, analysis, and planning may take years or only days. But the implications for the organization's future are large: money, prestige, the ability to attract staff and better serve clients all hang in the balance. At such moments the top level officer earns her or his pay by astutely conceptualizing, adapting, and negotiating to assure that the collaborative idea helps to shape the future course of the organization in desirable ways.

Two examples of the critical role of top level leaders in the success of new partnerships are the TECPLAY and Business Development and Training Center projects. The TECPLAY project of the National Institute for Work and Learning and the Charleston (SC) Higher Education Consortium provided a computer assisted program for upgrading basic skills and a comprehensive career development program to urban minority young adults. The short and long term success of the project is directly related to the roles played by the Mayor, the senior staff of Trident Technical College, the head of the local City Venture Corporation, and a number of community leaders. Their support and the resources they provided gave the project visibility and a solid footing which were central to its success.

The Business Development and Training Center (BDTC) at Great Valley Corporate Park (PA) is a cooperative joint venture of the Compact of Lifelong Education Opportunities and Rouse and Associates. The BDTC brings aggregated learning, business development assistance, and learning services to employees and employers in the park. Credit and non-credit courses, workshops and seminars, career academic counseling, assessment of prior learning, and networking are offered through the BDTC. Without the support and resources of the head of Rouse and Associates the Center would be little more than a good idea. The Chief Executive Officer of Rouse and Associates has provided space, financing, staffing, and, most important, visibility to the Center and its various activities.

Lower level initiatives: The ability to devote oneself single-mindedly to a project is one key resource that the top level leader can rarely provide. This, in contrast, is the most precious resource of people working at the lower levels of an organization. At any level and for any person, many competing demands on time and energy abound. But the top level executive has a job whose very nature requires multiple roles and responsibilities. Lower down the organizational ladder are located the responsibilities for actually implementing the details of specific projects, and, frequently, for creating the ideas that lead to other projects.

Small organizations such as small businesses, local unions, and smaller colleges have so many tasks to be done and so few people to do them that anyone with any enthusiasm is soon spread thinly over numerous responsibilities. In such cases it is hard to talk of organizational "levels." In part, this is the very reason the movement toward partnerships between education and work organizations has tended to focus on larger businesses and education institutions. Local unions and small businesses are so deeply and constantly involved in their primary "bread and butter" work that time and staff are not available to explore possibilities of partnerships, much less actually manage partnership projects. For these people to become involved in a collaborative education-work project means, by definition, that the purposes and activities of the project are directly related to the central purpose of their jobs and their organizations' missions.

Within larger organizations smaller, less visible projects initiated by individual managers and faculty can and have proved exceptionally valuable. Like the inventor in the garage, testing and refining a product until it is ready for market, small collaborative projects enable people with foresight and motivation to put ideas into practice and to integrate the lessons of practice into new conceptualizations. Implementing the concept may take many months, during which new insights are seen, the strengths and limitations of partnership and personal abilities are revealed, and the world outside the project constantly changes.

But what if a project that seemed to set a crucial example turns out to be unimportant in the grand scheme of events? Or perhaps it is headed in the right direction but lacks some necessary ingredient. Or perhaps it is timely and does constitute an example worth replicating. The smaller project can take these risks at a relatively low cost to the collaborating organizations. Indeed, the mutual learning that occurs through the project and the trust established between professionals and organization administrators may be more valuable as a basis for future joint ventures than the substance of the specific project.

The smaller project initiated by an individual manager, researcher, faculty member, or union official will seem to lack the "clout" that is associated with more powerful positions in the organizational hierarchy. If the project director decides that an advisory panel would be useful to assist in securing access to information or critique the development of the project, less prestigious people will be attracted to the lower level project than if the invitation comes from a top level executive. All is proportion: technical expertise and lower level contact people may be more important to the success of the project than the visibility and temporary prestige of "names."

The top executive can more easily gain the attention of news media and more readily command the attention of the organization's own publicity staff. On the other hand, individual faculty and staff with strong reputations within their own technical fields will have easier access to those specialized audiences. Having the flexibility to call on technical and institutional authorities as the situation warrants enhances collaborative projects by providing access to special skills and resources at all levels.

The lower level project is a valuable way to test the feasibility of ideas and of relationships between organizations. It is also a way of testing the ability of one's own organization to respond to the inevitable organizational problems of collaboration: scheduling, personnel, financial arrangements, decision-making and so forth. And the lower level project can be especially effective as a way of undermining the legitimacy of current practices and attitudes.

Whether one takes the viewpoint that the project is testing one's organization in a problem-solving way or undermining organizational practices in a confrontational, revolutionary way will depend in part on the personalities of the people involved and in part on the requirements of actual conditions.

In most education institutions, corporations, and unions, collaborative partnerships diverge from the standard operational procedures, the "S.O.P.s" of routine relationships and responsibilities. Few corporations rely on universities for the bulk of their research. Few colleges and universities rely on partnership programs with employers and unions for the bulk of their students, research opportunities, or curricular programs.

Inevitably, therefore, the individual who chooses to become involved in a partnership project is seeking to differentiate himself or herself from other faculty, administrators, or managers. Faculty in particular, because of the nature of college and university jobs and schedules, have time to pursue individual interests. These interests may take them into collaborative projects with populations (for example, migrant laborers, the unemployed, and welfare mothers) and organizations (for example, labor unions, civil rights organizations, community based groups of whatever kind) that represent interests frequently in opposition to the dominant business and political powers. Or, as is typical of business school faculty, the individual interest of the educator might be entirely consistent with the interests of the dominant political powers and aimed at improving the functioning of those dominant organizations. It is natural in these choices that the character of the partnership should take on the core attitudes of the individuals and organizations involved.

Thus in some cases the individuals initiating lower level partnership activities use them to differentiate themselves from their peers in hopes of improving their visibility and approval in the eyes of higher authorities. In other instances, by seeking collaborative projects with organizations not viewed sympathetically by those authorities, the initiators are challenging the powers that be. In either case the rewards of partnership projects are likely to attract entrepreneurial, individualistic persons. But the style of motivation and action will differ dramatically.

Collaborative activities, it seems, imply a certain level of confrontational spirit, either toward one's peers mired in routine or toward other organizations whose structures and behaviors have created the conditions which the collaborative project is meant to overcome. The Rural Education/Adult Development in Idaho (READI) project is one example of a new partnership that is characterized by a lower level initiative "on the margin" of its institution. Housed in the Cooperative Extension Service of the University of Idaho, the READI project helps develop computer literacy in rural adults. Working with local businesses and community groups, the project identifies ways technology can spur economic development in isolated rural communities. From its inception the project has been a lower level initiative of one committed energetic person who is "on the margin" of the Extension Service and the University.

The level at which a partnership project is initiated and operated within an organization profoundly influences who conceives, who negotiates, who directs, who performs, who assesses, who represents, and who benefits from collaborative education-work projects and programs.

Depth of Collaboration

Eventually the question of who collaborates begs the question of how deeply felt within an organization are the values and practices of collaboration. Do partnership programs and, more to the point, the style and methods of reaching out to other organizations affect an organization and its members superficially or profoundly? Are such programs praised as examples for emulation or are they restricted to the periphery of institutional attention? Are they used as catalysts for change within the larger parent organization? Or are they used for public relations purposes to demonstrate a degree of outward-looking concern while the rest of the organization is in fact shielded from the influences of their examples?

When used superficially, collaborative projects are not likely to be controversial. They do not challenge standard operating procedures and are likely to involve relatively few people. Scheduling, staffing, location, decision-making, assessment of results, and other matters requiring a sharing of viewpoints and authority among the collaborating organizations are carefully isolated to the collaborative projects. Implications for improvements in overall organizational performance are not discussed.

When used in more profound ways, the experiences of the organization in conducting collaborative projects are carefully examined for lessons learned. Standard operating procedures -- whether dealing with personnel, paperwork, remuneration, or other relevant topics -- are carefully reviewed and compared to those of other organizations. Inquiries about the project experience are encouraged. The board of trustees or directors is kept informed, and top officials are able to monitor the quantity and quality of the organization's efforts to establish and maintain collaborative relationships with other organizations. Members know that finding ways to work with other organizations is an acceptable means of solving problems.

An example of a new partnership that uses collaboration in a profound way is the Experienced Workers Re-Training Program of St. Louis Community College (MO). The program involves a local partnership of business, education, labor, and government to provide outplacement services to workers and employers affected by structural changes in the local economy. In addition to helping workers and employers, the project has had a profound impact on the relations between the college and business sectors in the community, not only in delivering training programs that are responsive to business needs but in a wide range of other areas as well.

IV. SUMMARY AND CONSLUSION

There are no simple answers to the questions surrounding collaboration. A college or university that bases its curriculum on cooperative education programs, requiring students and perhaps faculty to leave the campus and work at intervals in non-education organizations, is not necessarily a "better" or more effective organization than a college or university with a standard curriculum. It may operate on collaborative principles and may do a better job of serving those students who seek theoretical learning with work experience, but all this is done with trade-offs of time and energy that could have been spent on a traditional classroom curriculum.

A corporation that contracts with a university for a joint research program on computers or cosmetics is not necessarily better or more effective than its competitor that prefers its in-house research team. A company that joins a consortium of firms in supporting human development projects is not necessarily wiser than a firm that persists in going its own way. A union that develops a collaborative research and training project with a local college may in fact be spending resources better used on other union projects.

Partnership programs start from problems. Collaboration is a strategy for solving problems. The concepts of partnerships and collaboration viewed in the abstract are only solutions in search of problems. The benefits resulting from collaboration must be self-evident before a partnership program is initiated.

By the same token, organizations faced with problems need to look beyond their own boundaries and the limitations of their own resources when searching for solutions. The partnership option should be considered on its own merits.

Who in an organization collaborates depends on much more than the personality and motivation of individuals. Opportunities to initiate and participate in collaborative programs are directly influenced by an organization's mission, the locus of the collaborative activity within the organization, the level at which the individual works and at which the project is initiated, and the depth of an organization's experience with partnership projects.

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Building Effective Business/Higher Education Partnerships for Economic Development

Ivan Charner
Gerard G. Gold
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Colleges and universities have shown increased interest in developing partnerships with business and industry to contribute to local, regional, and state efforts in economic development. As collaborative projects have increased in numbers their nature has become more diverse, so that thousands of disparate examples of successful efforts can be cited. However, despite the great variety of projects, essentially they can be categorized as community development, institutional development, or business development.

Community development refers to partnerships for planning and implementing projects and programs to improve the economic and social qualities of life in a whole community or geographic area. Gains in individual or institutional wealth are assumed to contribute to overall public welfare. New or expanded college campuses, offices of government agencies or private employers, factories, museums, or other organizations are actively sought and developed by public and private interests for the additional jobs, tax revenues, and consumer spending they can be expected to bring to a community and region. Part of this expected value may be more indirect: for example, the expectation that the presence of one organization may attract others, whether as suppliers, competitors, or simply as neighbors constituting a core for economic growth.

The Economics Education Project of the Highlander Research and Education Center in Tennessee is an example of a new partnership for community development. The project is developing a participatory research and education process to enable residents of rural Appalachian communities to deal with the impacts of the changing economy on the economic and social qualities of their communities. Models of new partnerships between local higher education institutions and grassroots community groups have been developed. A new economics curriculum for local community development is also being formulated.

Institutional development involves a more self-serving analysis and utilization of the organization's own resources. In recent years, for example, colleges and universities have analyzed more carefully their real estate holdings and other real estate parcels in their vicinities. Reflecting on the successes of Silicon Valley near Stanford University, the Route 138 corridor near the research and engineering schools of the Boston area, and the Research Triangle of North Carolina's university research center, colleges and universities are planning new and higher values on their regional investments, their faculty, and their physical resources. Even universities that do not aspire to national status better understand the attractions of the campus research environment for businesses involved in knowledge production.

Institutional development involves new ways of identifying the tangible and intangible assets of the institution and finding ways to capitalize those assets and market them to potential partners. An example of a partnership for institutional development is the Model CAD/CAM Training Center at the Milwaukee Area Technical College that offers software and training materials in computer integrated manufacturing for retraining industrial workers. As part of the Center, a microcomputer-based CAD system was developed. The system has been sold to educational institutions and a dealership network has been established.

Business development includes elements of both community and institutional development. The aim here is to grow new enterprises or to assist older ones. Sponsoring entrepreneurial "incubator" centers and venture capital funds for small businesses, or organizing small business assistance centers (perhaps with state or federal government funding) may have community development as a primary purpose and institutional development as a secondary purpose. The method chosen is clearly that of improving the chances of business owners to achieve product development and marketing success. This is in contrast to the emphasis of community development on building an infrastructure of public services and core employers that supplies the economic "yeast" for self-generating growth. It is also in contrast to the emphasis of institutional development on the comparatively narrow self-interest of a specific organization.

The Small Business Incubator Project of Portland Community College in Oregon is an example of a partnership for business development. In addition to offering low cost rental space to small businesses, the project provides support services, classes, seminars, and professional consultations to the prospective entrepreneurs. Businesses can remain in the incubator during their developmental period, up to three years, after which the project assists with relocation to a permanent site.

Building Effective Partnerships

Partnerships or collaboration are the joint ventures between business and higher education that are characterized by several factors working in concert: voluntary institutional participation; multisector leadership and problem solving; a performance-based orientation committed to mutually identified and valued results; shared or complementary interests; and shared responsibility for agenda planning and action. Collaborative activities *are* different. They create situations in which decision-making authority over the design and operation of certain missions and functions of an organization is shared with "outsiders." This sharing of authority is what makes collaboration challenging, exciting, and risky.

Each partnership activity is unique and has a ripple effect on the structure and staff of the participating organizations. An understanding of the organizational conditions for collaboration is essential to an understanding of how partnerships can impact economic development. The basic factors involved can be described from three perspectives:

- The organization's mission: Are the style and substance of the collaborative program consistent with the organization's sense of its own identity?
- The level of leadership directly responsible for the collaborative initiative: What powers of position and resources are brought to bear in support of the program?
- The depth of institutional involvement in the program: Are the activities restricted legitimately to a small corner of the organization or are the opportunities and rewards widely distributed?

Effects of Mission

An organization's mission—its sense of main purposes—has much to do with the projects it selects for collaborative programs, the types and size of resources devoted to these programs, and the selection of the individuals to be involved. Computer firms prefer programs and projects that advance the sophistication, quality, uses, and reputations of computers. Insurance firms also look for means of improving their products, including economic and community development activities that enhance the value of real estate properties in their investment portfolios. Labor intensive businesses seek ways to strengthen the quality of the labor force, particularly as it affects the quality of entry-level workers, supervisors, managers, or skilled labor. The Honeywell English Language Training Program and the Motorola Special Technician Training Program are examples of how an organization's mission determines the nature of the partnerships entered into with institutions of higher education.

The English Language Training for the Workplace Program at Arizona State University provides English as a Second Language training to employees of Honeywell's Large Computer Products Division. The program uses an innovative functional approach to language training, The curriculum deals with language in a comprehensive way including grammar, pronunciation/intonation, spelling, communication strategies, style, and culture. The aspects of language skills are always presented with content drawn from the work environment at Honeywell.

The Special Technician Training Program of Rio Salado Community College in Arizona has trained production line workers of Motorola, Inc., in electronic and semiconductor technology. Participants are given paid leave for one year and all tuition costs are covered by the company. The community college has designed a one-year Associate in Applied Science degree program with courses held eight hours each week. Upon completion, participants are placed in electronic technician and semiconductor processor positions within Motorola. The contract between Motorola and the community college includes provisions for a training center, technical equipment, and cooperative education experiences for students.

The missions of educational institutions establish the direction of their partnership interests. Major research universities look primarily for partnerships that advance their reputations as innovators on the cutting edge of new knowledge in fields such as literary analysis, pharmaceuticals, organization theory, or ceramics. Other universities and colleges (or other departments at the same institutions) seek partnerships that advance their reputations as innovators in applied research and producers of high quality professional workers. Liberal arts colleges seek partnerships that promote their view of the world, seeing themselves as producers of creative managers and preprofessionals. Community colleges draw on their several missions as providers of lifelong learning to adults, entry-level technical training, remedial learning to employees lacking needed skills, and technical assistance to local small businesses.

The Education Bridges to Options in High Technology Employment project of San Diego State University and the Upper Division Bachelor of Science in Nursing (BSN) project of New York's College of Staten Island are examples of how the mission of an educational institution can dictate the nature of its partnerships. The San Diego State University project offers retraining and updating in biotechnology and analytical chemistry to mid-career scientists for professional development and career advancement. The project responds to the school's mission of serving the expanding high technology industrial community in San Diego County. The College of Staten Island project provides access to baccalaureate training in nursing for working registered nurses. The program is consistent with the college's mission of meeting the educational needs of working adults and the human resource needs of health and social service deliverers in New York City.

Level of Leadership

The question of who collaborates in education/work partnership projects and programs also must be answered in terms of the level or levels within an organization at which the partnership activity is initiated. Major differences in style and substance of partnerships are affected by the relative differences in power, prestige, resources, and visibility associated with different levels within organizations. These differences frequently determine who gets involved and the nature of that involvement.

Executive level initiatives. The involvement of executive level officials in a collaborative education/work project usually implies the making or anticipation of a decision related to one or more of six factors: a major investment of financial resources, a major shift in institutional mission (or the decision to reject a proposed shift in mission), a major change in organizational practices, a major personnel change, a major public relations opportunity to represent the organization and take credit for some extraordinary accomplishment, or a major political move to assuage or reward some individual or group.

The involvement of top officials in a collaborative project probably has little to do with the substantive content of the project itself and far more to do with impact of the project on the organization. Though the topic may be dear to the leader's heart, the development of a new computer-assisted design program, the retraining of displaced workers, or the enrollment of assembly line workers in a technician level degree program must take second place to the question of whether the proposed activity will enhance the survival, continuity, and growth of the organization in a constantly changing world.

Two examples of the critical role of executive level leaders in the success of new partnerships are the TECPLAY and Business Development and Training Center projects. The TECPLAY project of the National Institute for Work and Learning and the Charleston (South Carolina) Higher Education Consortium provided a computer-assisted program for upgrading basic academic skills and a comprehensive career development program to urban minority young adults. The immediate and long-term success of the project is directly related to the roles played by the mayor, the senior staff of Trident Technical College, the local directors of City Venture Corporation and Control Data Corporation, and a number of key community and business leaders. Their support and the resources they provided gave the project visibility and a solid footing that were vital to its success.

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Center would be little more than a good idea. The chief executive officer of Rouse and Associates has provided space, financing, staffing, and most important, visibility to the Center and its various activities.

Lower-level initiatives. The ability to devote oneself single-mindedly to a project is one key resource that the executive can rarely provide. This, in contrast, is the most precious resource of people working at lower levels within an organization. At any level and for any person, many competing demands on time and energy abound, but by its very nature, the executive's job requires multiple roles and responsibilities. Lower on the organizational ladder are located the responsibilities for implementing the details of specific projects, and frequently, for creating the ideas that lead to other projects.

The Rural Education/Adult Development in Idaho (READI) project is one example of a new partnership that characterizes a university's initiative at a lower level in the organization. Housed in the Cooperative Extension Service of the University of Idaho, the READI project helps develop computer literacy skills for adults living in rural areas. Working with local businesses and community groups, the project identifies ways by which technology can spur economic development in isolated rural communities. From its inception the project has been a lower-level initiative of the Extension Service and the University.

The level at which a partnership project is initiated and operated within an organization profoundly influences who conceives, negotiates, directs, performs, assesses, represents, and benefits from collaborative education/work projects and programs.

Depth of Collaboration

Eventually the question of who collaborates relates to the question of how deeply an organization values and practices collaborative efforts. Do partnership programs and the style and methods of reaching out to other organizations affect an organization and its members superficially or profoundly? Are such programs praised as examples for emulation or are they restricted to the periphery of institutional attention? Are they used as catalysts for change within the larger parent organization? Or are they used for public relations purposes to demonstrate a degree of outward-looking concern while the balance of the organization is shielded from the influences of their examples?

When used superficially, collaborative projects are unlikely to be controversial. They do not challenge standard operating procedures and are likely to involve relatively few people. Scheduling, staffing, location, decision making, assessment of results, and other matters requiring a sharing of viewpoints and authority among the collaborating organizations are carefully isolated to the collaborative projects. Implications for improvements in overall organizational performance are not discussed.

When used in more profound ways, the experiences of the organization in conducting collaborative projects are carefully examined for lessons learned. Standard operating procedures—whether dealing with personnel, paperwork, remuneration, or other relevant topics—are carefully reviewed and compared to those of other organizations. Inquiries about the project experience are encouraged. The board of trustees or directors is kept informed, and executives are able to monitor the quantity and quality of the organization's efforts to establish and maintain collaborative relationships with other organizations. Members know that collaborating with other organizations is an acceptable means of solving problems.

Summary

Partnerships for economic development are essentially of three types: partnerships for community development, partnerships for institutional development, and partnerships for business development. Within each of these categories are many different opportunities for projects linking higher education and work institutions. The actual initiation and the scale of activities are influenced by many factors including institutional missions, levels of leadership, and depth of collaboration. Partnerships or collaboration between higher education and business can be effective strategies for economic development.

This paper is based on ***Higher Education Partnerships: Practices, Policies, and Problems,*** by Gerard G. Gold and Ivan Charner from The National Institute for Work and Learning, a private, nonprofit research and development organization in Washington, DC.

The majority of the examples used in this paper are taken from a group of projects that comprise the Education and the Economy Alliance, a program supported by the Fund for the Improvement of Postsecondary Education, U. S. Department of Education. For more information on any of these projects, contact the first author at the National Institute for Work and Learning. NCCE

POSTSECONDARY EDUCATION
FOR A
CHANGING ECONOMY PROJECT

HIGHER EDUCATION AND THE STATE: NEW LINKAGES FOR ECONOMIC DEVELOPMENT

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AND

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HIGHER EDUCATION AND THE STATE:

NEW LINKAGES FOR ECONOMIC DEVELOPMENT*

OVERVIEW

Linking colleges and universities to economic development is one of the most powerful movements operating in American higher education today. Both the global and national economies have become knowledge-driven. Specialized knowledge has become the indispensable asset for future economic development. And it is in our universities where advanced knowledge in science, engineering, and technology is nurtured and concentrated.

The higher education-economic development movement has mushroomed across the country and spread overseas to industrialized nations and many developing nations as well, including China. There is now another movement afoot among American governors to broaden their present commitment to elementary and secondary education to encompass a new drive to strengthen the quality, contributions, and performance of higher educational institutions as priorities for the 1986 legislative year.

Governor Thomas Kean, taking office as chairman of the Education Commission of the States, told a state leadership audience in Philadelphia on July 26, 1985, improvement in the quality of college and university education will be one of his two top priorities for a three-year period, support for public school teaching the other. He spoke of the importance of listening to the higher education community and examining successful state practices but emphasized "above all, our purpose is to articulate a vision for the resurgence of American higher education." He called for preparation of an interim report early in 1986 to be ready for state legislative sessions and "practical suggestions for effective state action." Economic and national renewal, he contends, demand no less.

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* This is one of a series of papers written as part of the Postsecondary Education for a Changing Economy: Resource Agent for Policies and Practices Project for the National Institute for Work and Learning. Funding support for the project was provided by the Fund for the Improvement of Postsecondary Education under grant number G 008440477.

Lamar Alexander, Governor of Tennessee, also chose education as one of his top priorities when he became chairman of the National Governors' Association on August 7, 1985. One of seven gubernatorial task forces he appointed on education is chaired by Governor John Ashcroft and is assigned to assess college quality and to tackle the knotty problem of developing effective methods of evaluating the results of postsecondary education. New criteria are now needed to enable governors and legislators to make comparisons of how well higher education is performing, assessing progress, and allocating resources consistent with state goals. Gauging the performance of public higher education is elusive at best without concrete indicators.

The astonishing surge of political and economic interest in our universities and the appearance in state after state of creative new research partnerships with industry are no fluke. This phenomenon is partly explained by economic conditions, partly by rapid fundamental changes in science, technology, and the world economy. For example, new technology has produced about 90 percent of all human knowledge in the sciences in the last 30 years alone. That knowledge will double again in the next ten to fifteen years.

It was not only dire financial straits that forced higher education to begin opening up to new economic partnership opportunities with business and industry in 1981. The pressures of severe inflation and recession account for part of it -- Reagan budget cuts and state government retrenchment compounded these financial problems; the increasing failure of campus revenues to keep pace with skyrocketing costs also contributed.

Even more telling perhaps were sweeping worldwide and national forces that shook a fragile infrastructure of higher education out of its lethargy and defensive posture into a series of innovative high technology partnerships and joint ventures with industry and government. These forces included:

- The arrival of the knowledge economy. Knowledge industries today account for over 50 percent of the American Gross National Product. One out of every two workers is employed today in either the collection, organization, or dissemination of information.
- In an economy where knowledge has become a critical economic resource, the university lodged at the center of the knowledge process becomes the fuel that feeds the engine of national economic productivity.
- Productivity research establishes that since 1929, human capital has contributed more to American economic growth than financial capital, machines, or factory plants. Knowledge, education, and training have become the essential tools for developing human capital.
- The United States no longer dominates the global economic system as it did from 1945 to 1970. The United States has already lost world market leadership in such critical industries as autos, steel, machine tools, and consumer electronics.
- Acute international competition confronts 70 percent of all American goods sold in this country or abroad.

New England was one of the first regions to see its economic future tied directly to higher education. It suffered badly during the recessions of the 1970's. It has a greater concentration of colleges and universities than other regions of the country -- by the late 1970's it had become a knowledge-intensive economy, ready to redefine and redirect its aging and decaying economic infrastructure.

Given the Reagan Administration's philosophy of reducing the power and size of national government and restoring power to the states, the federal government is no longer the place to look for leadership and new initiatives in higher education-economic development. The governors' initiative in higher education is a new departure -- they instead, of federal leaders, define the pressing issues for higher education. No longer do the President and Congress lead the way as had been the case for so long with the Morrill Act of 1862, the G.I. Bill of 1944, the National Defense Education Act of 1958, and the Higher Education Opportunities Act of 1965.

The states are not only the largest financial source of revenue for colleges and universities, they have been steadily increasing their share, while the Reagan Administration battles in Congress to cut back even further the federal share of funding support. It becomes logical then to look to the governors for energetic leadership since by virtue of their office and the resources they control they are the most visible, powerful, unifying leaders in the states.

Nevertheless the governors have yet to develop a vision for higher education, as Governor Kean concedes, nor even a specific agenda. Nor has prime public attention been focused yet on higher education. The governors and their constituents have been preoccupied with the quality of education in the public schools. Now that the wave of interest has peaked, they are in a position to turn next to the higher education resource, a system unrivaled by any other in the world in magnitude of investment, size, and diversity.

Among industrialized powers, American enrollment in college relative to population nearly doubles that of its closest competitor, Canada. Take the adult population, for example; almost 32 percent of American citizens 25 or older have at least some college education compared with 17 percent of Canadians and 17 percent also for East Germany, heading the list of Communist countries. In round numbers for the United States:

- three of five high school graduates enroll in college;
- 12 million students are enrolled in 3,300 colleges and universities;

- colleges and universities will spend $100 billion in 1985-86 for their operating budget, accounting for three percent of GNP; and
- colleges and universities employ two million people.

But where do state legislatures fit into the picture? State action requires their support. They pass the budgets which make possible state programs. Nevertheless, despite its wide array of formal powers, because of the way it is organized legislative leadership is divided, fragmented, and less visible than that of the governors. This paper turns next to higher education's connection to state legislatures and how a new venture underway in New England enlarges opportunities for regional economic development.

Following the New England case study is a review of four notable partnerships between higher education and the state in Georgia, Iowa, Pennsylvania, and Massachusetts. The final section discusses the broadening role of higher education in the economy and its newer responsibilities to state legislatures.

A NEW DEPARTURE

The New England Board of Higher Education (NEBHE) is an independent corporate creature of the six states of the region, created by the six governors in 1955, including Abraham Ribicoff of Connecticut, Edmund Muskie of Maine, and Christian Herter of Massachusetts. It is a Compact organization provided for under the Constitution of the United States, approved by the state legislatures, and ratified by Congress. Its interstate mission is to pursue the interests of higher education for the citizens of the New England states in medicine, science, technology, and other professional fields. Legislators from all six states serve as Board members.

New England's strategic plan for higher education and economic development is found in the Threat to Excellence report of the New England Board of Higher

Education's Special Commission on Higher Education and the Economy. Supporting documents and texts of the plan include the Prospectus, called by David Warsh, columnist of the Boston Globe, "the best case I've read yet for support of higher education in New England;" also three books published on Business and Academia, New England's Vital Resources: The Labor Force, and Financing Higher Education. A policy paper prepared for the Legislative Office for Research Liaison of Pennsylvania's House of Representatives calls Business and Academia "an excellent idea and strategy book" and says Financing Higher Education is "Highly recommended for perusal in terms of an excellent overview on the subject of higher education and economic development issues for state policy."

Two central questions New England's strategic plan addresses:

- Why should institutions of higher education want to help the economy of New England?
- What do these institutions do to assist the economy of the region?

The plan and accompanying texts document:

- The contributions of higher educational institutions to economic development in New England;
- A precise definition of the economic and social dimensions of the industrial mix of the 1980's and its significance for institutions of higher education; and
- Identification from the lessons and experiences of the 1945-80 period of factors relevant to new problems confronting state and regional economic policymakers and the ways institutions of higher education may address them.

The Threat to Excellence recommendations called for formation of an ad hoc committee of state legislators to hold public hearings in all six states on the issues raised in the report. Out of their call to action came the idea for a new initiative between the New England Board of Higher Education and the New England state legislatures. The issue would be higher education and economic development -- the theme would be increasing the return on the public investment in the region's colleges and universities.

The result is a new focused regional alliance forged between higher education and the state legislatures that has been five years in the making--three years of planning and organizing, two years of testing.

It is ironic that this new alliance has appeared first in the East, historically a stronghold for private colleges and universities not dependent on the state legislatures for support. New England has nearly twice as many private institutions per capita as the rest of the country: 49 percent of the region's students are enrolled at private campuses, 2 1/2 times greater than the national private enrollment level of only 20 percent.

The development of such an alliance might have been expected to appear in the West which has traditionally been known for its stronger public institutions of higher education and closer ties with state legislatures. The emergence of the legislative initiative in New England may simply reflect a greater need for strengthening higher education's weak ties with the region's legislators.

Higher education and New England are virtually synonymous. This is not only because of the long distinguished history of colleges and universities in New England and their contributions to the region's distinctive quality of life. It is because of both of these reasons plus the overarching fact that higher education has a greater economic impact in New England than anywhere else in the country.

FIPSE SUPPORT FOR NEW ENGLAND

The regional pilot project is supported by a three year grant from the Fund for the Improvement of Postsecondary Education (FIPSE) of the U.S. Department of Education. The purposes of the project are to better inform legislators about the significance of higher education to each state economy and the region and to better prepare legislators to make more informed judgments on issues concerning investment in human capital.

With one more year left of the grant, the preliminary results are promising, offering a new way of doing business between higher education and legislators--one built on trust, collaboration, and effective sharing of resources. The Christian Science Monitor commented on the new program on August 29, 1983, "If the educate-the-lawmakers plan works for higher education in New England, it should work elsewhere and on other levels... That's not all the schools need but it's an excellent beginning."

Coincidental with the development of the new project, E. Terrence Jones in an article for the Educational Record in the summer of 1984 called for higher education to "revamp its political efforts" in order to "maintain and increase its financial support from the state." Jones, Dean of Arts and Sciences at the University of Missouri-St. Louis, argues higher education should support increasing state revenues instead of asking for a bigger slice of the same economic pie and this can be achieved by "stimulating economic development." He urges replacing the old kind of go-it-alone university lobbying with a new style of university political relations, one based on an "organized effort to understand better what the state thinks about higher education and to explain more effectively academe's contributions to the polity."

What Jones persuasively argued for in 1984, NEBHE 1200 miles away successfully proposed to FIPSE and quietly began in 1983. The Caucus of New England State Legislatures agreed to jointly sponsor the project with NEBHE. The Caucus is the administrative arm of the region' six state legislatures, seeking greater cooperation and coordination of policy issues. The project started slowly without fanfare and began to gain momentum as it moved across the map of New England state capitals from Concord to Providence to Boston to Montpelier during the next two years.

THE STRATEGIC ENVIRONMENT

The time was ripe for a legislative project of this type. Historically higher education's relations with lawmakers have been fragile, sporadic, and defensive at best. The efforts at contact all too often have been limited to budget time. There was and is a need for better communications. But there is more to it than that.

In a speech to a policy briefing of New Hampshire legislators launching the pilot project in November 1983, Speaker of the State House of Representatives John Tucker said, "New England's strong higher education system, both public and private, has enabled our economy to remain vibrant and strong." He is concerned though about the competition from other regions that threatens the region's future economic stability. He sees the legislative alliance with higher education as an opportunity "to focus on what we have to do as a matter of public policy to ensure that New England's higher educational enterprise remains strong."

NEBHE's assessment of the strategic environment for colleges and universities found several shifts taking place. They all revolved around the economy and the financing of higher education:

- the federal share of higher education revenue reached 24 percent by 1969-70, held at roughly that level for a decade, and has been declining ever since--reaching a new low for the past 25 years of nine percent in 1984-85;
- the state share of higher education revenue is rising as the federal share dwindles; and
- the Reagan Administration's philosophy of federalism requires divesting the national government of funding responsibility for education and lodging more of it with the states, a trend likely to continue for the remainder of the President's second term in office.

Considering that federal, state, and local government together supply as much as 50 percent of all higher education revenue and the states account for two out of every three dollars of government's share, state government is the place to look for greater financial support.

NEBHE believed it could work closely with the governors in the future--the governors are generally well-informed on the policy and political significance of these issues and have substantial resources to draw on. But how to educate and inform the 1,323 legislators in six New England states? Few legislators were well versed about education, let alone higher education; most lacked the time to devote to it and deferred to colleagues who specialized in the higher education field.

TECHNIQUES TO INFORM LEGISLATORS

In carrying out the project, NEBHE relies on four basic techniques to inform and help focus legislative attention on higher education and its impact on state economies. The approach is to do for legislators what they don't have time to do for themselves as far as higher education is concerned. A baseline survey was taken of legislators; policy briefings are held; publication of proceedings are mailed to all 1,323 legislators; and legislative advisers are used.

Many legislators knew about the impact of higher education on the quality of life and the economies of their local districts. Few, however, knew about the economic impact of colleges and universities overall on their states and the region. The data were not readily available. Hence, the development of the four basic techniques:

- An opinion poll taken of the region's 1,323 legislators on their attitudes about higher education's role in economic development. Over 50 percent responded. Two major findings were that 9 of 10 legislators want academia to furnish better data to government; three-quarters believe communications between legislators and higher education are inadequate.

- Policy briefings held in each of the state capitols. Extensive data and tables tailored to the state at hand are provided to legislators attending. Evaluations taken after the meetings show the great majority of legislators view the briefings as "a helpful learning experience" and would like to see them held annually in the future.

- Publications of the proceedings of the policy briefings. The Appendix contains a representative example of one of the six publications, that of the Vermont seminar.
- Periodic meetings of a Legislative Advisory Council. The Council is an advisory group of legislative leaders from the six states created for the three year term of the grant. Plans are reviewed with the legislative advisers from the six states, and evaluations of the policy briefings and other activities are reported to them for their advice and counsel.

CREATING A MORE FAVORABLE CLIMATE

One may rightfully ask what results flow from New England's legislative project? From an appropriations point of view, this is what the record shows. Starting from a comparatively low base of public support for higher education in the New England states, Massachusetts' large percentage increase in appropriations in the past two years ranks it fourth in percentage increase among all states nationally. Maine has followed suit in stepping up appropriations for higher education, ranking fifth in percentage gain, followed by New Hampshire in 17th place, Connecticut 19th, Rhode Island 38th, and Vermont finishing 39th.

Still, it should be recognized that the benefits do not simply translate into cause and effect patterns for dollars appropriated. The legislative process is certainly more complex than that. Rather, NEBHE's partnership initiative with the Legislative Caucus creates a more positive climate overall for higher education in the state legislatures. Access is provided, attention is focused on issues, and dialogues developed.

Legislators have had their awareness and information levels raised by being shown the concrete economic contributions of higher education to their states. Legislators from all committees, not just those from education committees, now pay more serious attention to higher education's message. Not only are legislators given new data and analyses of trends but this information is provided in a comparative format -- measuring how their states compare with the rest of the New England states and national norms.

As Carolyn Morwick, executive director of the Caucus puts it, "the ongoing process results in higher education becoming more understandable and appreciated by legislators." She says "the positive climate created by the interest shown in state legislators and the process of informing them has probably led to their devoting more money in budgets for higher education because they can see the benefits more clearly." In other words, more legislators now see higher education as an investment in long-term economic development rather than as merely another budget expense for the state.

What can other institutions of higher education do if they're interested in drawing on the New England Board's legislative model? Of course the political traditions and conditions of each state determine the opportunities for collaboration. Ideally the project is most suited to regional or statewide organizations representing colleges and universities. Either existing organizations can be used, as has been the case with NEBHE, or new groups can be organized for that purpose. However, sub-regions of a state can profit as well. Any grouping of colleges in a geographic area can collectively organize and use their resources to better inform legislators about their community.

A word of caution though for other regions. Representative Irving Stohlberg of Connecticut, chairman of the Caucus of New England State Legislatures, says, "I'd be cautious in transferring conclusions about our higher education project to other regions. The project has more application in New England than elsewhere because of our strong tradition of higher education, cohesiveness and smaller distances to travel." While it is true that what works in one region may not work in another, other regions facing common problems will benefit from knowing what gave rise to the New England legislative model, what makes it work, and what effect it is likely to have in the future.

New England's strategic plan for higher education and economic development is long-term. No one expects the goals to be achieved quickly. The new legislative program helps to set the agenda for establishing objectives, defining the issues, and keeping the issues before the legislatures. New Hampshire's House Speaker Tucker says, "the Threat to Excellence plan should not be a one-time shot but an ongoing issue for economic survival, one that has to be fine-tuned and constantly kept before the legislatures." The high turnover every two years of state legislators means there are many new faces to inform as well as a continuing pool of legislators spread thin over an endless array of issue areas. Keeping higher education before the legislators as a resource to be tapped for economic development rather than as a special pleader is the mission of the New England project.

STATE-HIGHER EDUCATION INITIATIVES

A telephone survey of national and regional organizations reveals that, outside of New England, no other region or state is pursuing a higher education initiative aimed at state legislators. The importance of legislators to the budget and policy-making process is obvious but it is the governors who are monopolizing attention. State legislators have yet to be awakened to their potential for leadership, assessment, and energy in guiding and monitoring higher education's contributions to state economic development.

Linking colleges and universities to economic development is the hallmark today and for the immediate future of every state in America, every industrialized country in the world, and many developing nations. A dazzling array of research and development (R&D) partnerships centered in universities has been initiated in virtually every state in the union -- aimed at private industry and supported, in part at least, by the state. This is the greatest mobilization ever of America's higher education institutions in peacetime for purposes of economic development.

The higher education-economic development movement is rooted in the period 1973-1982 in the worst peacetime world economic conditions since the great depression of the 1930's -- and further in the restructuring of the global economy in which the United States remains a leader but no longer dominates as it once did. Quality and cost, driven by technological improvements, now dominate world markets.

Three important new studies evaluate a wide array of R&D partnerships begun since 1980. James Botkin and Dan Dimancescu, technology consultants and co-authors of Global Stakes and The Innovators, have written an excellent analysis of 15 leading research consortia in a forthcoming report funded by the Carnegie Corporation of New York on America's New Experiment: R&D Consortia. Their study, which will be published by Ballinger Publishing Company, judges North Carolina's microelectronics center and Stanford University's Center for Integrated Systems as the strongest collaborative ventures and Massachusetts' Centers of Excellence project as the weakest. They find that research in high technology must be sustained for the long-term at a substantial level if it is to be effective, requiring a minimum commitment of at least 10 years.

Charles Watkins, professor at Howard University, wrote two comprehensive evaluations of high technology research partnerships in the states for the National Governors' Association in 1985, resulting from studies funded by the National Science Foundation. In his report on "Programs for Innovative Technology Research in State Strategies for Economic Development," Watkins concludes that a state's goals for technology must be set with regard for its own economic and demographic characteristics as well as its technological infrastructure. He finds state-initiated R&D programs contribute either to actual job creation through technological innovation or at least the image of a robust, progressive economy.

In "State Programs to Encourage the Commercialization of Innovative Technology," Watkins acknowledges that the short life to now of most of the initiatives prevents a rigorous comparative evaluation. Such programs, according to Watkins, appear to have stimulated economic activity and certainly create an optimistic outlook about the state's economic future. Nevertheless, one must be cautious about premature claims of success, the enthusiasm and self-promotion of the program's backers, and the uncertainty of bright projections about future results before a solid track record has been established. The phenomenal growth stories of the Silicon Valley and Route 128 are unlikely to be repeated in many places because of the huge technological infrastructure required, built up over decades of development. Nor has it been established yet that state assistance programs can produce the financial growth and markets achieved by private sector companies such as Apple Computer or Hewlett-Packard.

The third of these valuable new reports reviewing the mushrooming growth in high technology research centers is the Northeast-Midwest Institute publication on Partners in Growth: Business-Higher Education Development Strategies. This study reports that by the end of 1984, at least 44 states had established university-based research centers for high technology development. These programs and others described present a broad perspective on what universities can contribute to economic development, including: R&D technology transfer; informal university-industry information networks; universities as business consultants; university-run industrial extension services; and university-industry cooperative research. The inventory reflects a wide array of economic strategies to enhance business-university partnerships that contribute to economic productivity and competitiveness.

FOUR NOTEWORTHY PROGRAMS

Four notable partnership cases that either don't appear or receive only brief mention in the studies noted above deserve separate mention because of their originality, magnitude, or effectiveness.

First is the Ben Franklin Partnership in Pennsylvania which resulted from two years of preparation of a strategic economic development plan for Governor Dick Thornburgh. He rapidly implemented the plan with the support of the legislature not only to revitalize his state's economy but to move it away from excessive dependence on heavy manufacturing. The plan focused on the use of new technologies in basic industries, the spinoff of technological innovations for new business development, and emphasis on advanced professional services.

During its two-and-a-half years of existence, the Ben Franklin Partnership (BFP) has designated, after a competitive process, four Advanced Technology Centers encompassing the major public and private research universities in four regional centers of the state. In less than three years, Pennsylvania has created what Governor Thornburgh describes as the largest and most highly leveraged technological development program in the country. A total of $115 million has been committed, $29 million from the state and $86 million in matching support from the private sector. Up to April 30, 1985, the BFP Centers reported:

- 12 patents issued;
- $22 million raised in venture capital;
- 7,400 persons enrolled in Center training programs;
- $1.2 million won in Small Business Innovation Research awards; and
- 7,100 graduates of training programs.

A notable case little known beyond its own state and regional borders is that of the Industrial Extension Service (IES) of the Georgia Institute of Technology. IES's 13 field engineers each assist and provide technical information to an average of 13 counties and 480 companies. The program began in 1961 and was designated by the General Assembly of Georgia in 1975 as a part of the state's official productivity center at the Georgia Institute of Technology.

The international consulting company of Arthur D. Little evaluated Georgia's Industrial Extension Service and found it was responsible for producing $22 in economic benefits for every dollar the state invested. The field engineers help companies become more efficient and save costs by solving tough technical problems such as plant layout, pricing systems, marketing, and compliance with government industrial regulations. The field engineer operates much the same as a county agent working with farmers under the federal government's Agricultural Extension Service, which has been remarkably successful in spreading new technologies and helping American farmers become the most productive growers the world has ever seen.

IES assistance is primarily provided for short-term projects at no cost to the companies but can be extended by contract. The payoff to Georgia's economy is in jobs: creating them, keeping them, and making them more efficient. Though serving large and small companies alike as well as county and local government, IES is aimed mostly at smaller companies because they account for 78 percent of all businesses in Georgia, employ 2/3 of all workers, and create 3/5 of all new jobs.

Georgia Tech's ability to generate the applied research so valuable to the manufacturing companies of its state can be seen from its latest ranking by the National Science Foundation as first in the nation among state-supported institutions of higher learning for engineering research and development expenditures. McKinsey & Co., a Big Eight accounting and management firm, concluded in a study last year of future economic prospects that "development of leading edge technology is essential to maintaining the rate of employment growth in Georgia and increasing the standard of living in the state."

One of the most successful partnership programs for the future is that of the Bay State Skills Corporation (BSSC) in Massachusetts. This independent corporation, established and partially funded by the Commonwealth of Massachusetts, has in the four years of its life attracted the participation of over 600 companies and 100 institutions of higher education. Nearly 8,000 people have been trained through BSSC programs. BSSC provides 50 percent of the funds needed; the other 50 percent is matched by industry, with colleges and universities used as contractors. For example, Simmons College trained 25 underemployed and unemployed women for entry-level professional positions as manufacturing system specialists. The biggest contributors to the program were Hewlett-Packard, Digital Equipment Corporation, Wang Laboratories, and five other high technology companies. Tufts University provided entry-level and advanced skill training for 31 biotechnology technicians, supported by six expanding biotechnology corporations, including Waters Associated/Millipore Corporation and the Dupont Company.

Other states seeing the great success enjoyed by the Bay State Skills Corporation have passed legislation based on the Massachusetts model. They include the Minnesota Job Skills Partnership, the Washington State Job Skills Corporation, and the Bluegrass State Skills Corporation of Kentucky.

Iowa, a leading agricultural state suffering from the depression in farming, has created a novel Industrial New Jobs Training Program for business and industry that uses special tax incentives to pay for customized training arranged at the state's 15 community colleges. The program pays up to 50 percent of the salaries of trainees for new and expanding companies engaged in production or interstate services. The purpose is to provide an economic development incentive for industry by lowering start-up costs, improving productivity, and enhancing profits.

Over 5,000 people have been trained since the program began in 1983. Training for new jobs has been provided for 203 new employees at Sara Lee, 968 at Greyhound, Inc., and 450 at Wal Mart Corp. Under legislation creating Iowa Jobs Training, no up-front grant or current state funds are used. Instead, financing is generated by the training certificates issued by the community colleges, authorized by the state, and sold in the financial market. Funds paid for the training certificates are used to finance the project and to reimburse the employer for part of the training cost. Repayment of the certificates is provided by a withholding tax credit of one-and-a-half percent of the wages of new jobs and is further backed by a portion of the property tax on new facilities and equipment set aside as a standby reserve to secure payment of the certificates. Approximately $11 million were reimbursed to participating companies as of June 30, 1985.

These four very different state initiatives indicate the variety of possibilities available for higher education partnerships. Pennsylvania's Ben Franklin Partnership is important not only because of its size and high degree of leverage of state funds appropriated but because it resulted from a comprehensive strategic plan for economic development launched by Governor Thornburgh and draws heavily on the strengths of both public and private research universities in the state. Georgia's Industrial Extension Service has the potential of becoming the high tech equivalent of the Agricultural Extension Act of 1914 which disseminated the latest information and spread state-of-the-art technology from America's land-grant universities to farmers in agricultural extension stations across the states. The Bay State Skills Corporation in Massachusetts is the forerunner of state training programs designed for jobs in a knowledge-intensive economy. Iowa's Industrial Jobs Training program is an innovative way of using tax incentives combined with higher education resources to aid economic development.

The initiatives and studies discussed in this section of the paper build on existing economic and higher education strengths of the state. They do not attempt to create new technological infrastructures. Stung by the 1981-82 experience of the highest unemployment rate since World War II, the overriding consideration for the states is job creation. Higher education has become recognized as the key resource in our knowledge-intensive and technologically-oriented economy to further this objective.

In the case of the New England Board of Higher Education, it received its money from a federal agency for a regional project. No legislation was necessary, only the agreement to cooperate between NEBHE, the Caucus of New England State Legislatures, and the state legislatures themselves. The other initiatives occur at the state level only and require formal state authorization and investment. The features of these more formal partnerships are:

- The state acknowledges a fundamental problem of its economy.
- A strategy is designed to attack the problem. Legislation is passed, seed monies or matching funds are appropriated to support collaboration between business and industry and higher education.
- The state acts as a catalyst playing a secondary not a primary role.

The pitfall of the formal state initiatives is that they require a substantial and long-term investment. A steady commitment through good times and bad is essential--not only during the current economic recovery and expansion which has filled most state coffers beyond the fondest expectations of governors and legislative leaders. Though the early reports of these ventures sound promising, the marketplace will ultimately determine whether these state investments will bear fruit in the form of economic expansion and job creation beyond the costs involved.

AN INTERNATIONAL PERSPECTIVE

The industrialized countries of the world are likewise moving rapidly to overhaul their higher education systems, linking them more closely to economic and technical development. Overseas, in contrast to the American experience, it is the national governments which are setting the goals, choosing the institutions and programs to be favored, and re-allocating their budgets. In the United States those decisions have been pushed down to the state level. The Reagan Administration's deliberate relinquishing of initiative and decision-making to the states provides an unusual opportunity for the governors and legislators to exercise leadership and channel resources for higher education into areas vital to economic development. However, the extreme decentralization of authority over higher education in the United States creates problems and ambiguity of goals and priorities, duplication of efforts, and blurred focus in allocating resources.

It is well-known that the United States and Japan are far ahead of their competitors in their technological shares of the world market. Japan's plan for the 1980's has been established by its Ministry of International Trade and Industry (MITI). MITI planned a knowledge-intensive, high technology economy resting on the cornerstone of a high quality educational system. For Japan, technology has become the centerpiece of its competitiveness and achievement of economic security.

The West European countries, though proficient in basic research, lag well behind the U.S. in applied research and behind Japan in commercialization of new technologies. Individually they have begun the process of overhauling their national systems of higher education and economic development to make them more responsive to global market conditions.

France

Prime Minister Laurent Fabius is upgrading the quality of the French educational system to use it as a vehicle for modernizing the economy. The objectives he and Minister of National Education Jean-Pierre Chevenement are pursuing include:

- Making the university more relevant to the country's needs.
- Accepting the principles of economic competition in educational and national life.
- Training the maximum number of high-quality research workers in universities. France needs seven to ten thousand a year more engineering graduates beyond present output by 1990 and 14,000 a year more by the end of the century.
- Emphasizing teacher training to improve the quality of instruction and continuing education to encourage lifelong learning.

France is mobilizing university science departments and engineering schools throughout the country to connect their courses more directly to the skills needed in high technology industries such as computers and telecommunications. The Ministry of Education announced in June 1985 that it will allow universities for the first time to enter into direct partnerships with industrial corporations. Prime Minister Fabius says the new approach is part of a "necessary opening of the universities" to the outside world and a strengthening of links between the worlds of work and education.

To monitor higher education's effectiveness in this new movement, the French government has established a 15 member commission to prepare annual reports on the performance of the universities.

Great Britain

Prime Minister Margaret Thatcher's government produced a green paper for discussion last spring, similarly calling for a higher education system more closely linked to the needs of business and industry. The policy paper concludes that universities and colleges can contribute to Britain's economic development by encouraging more positive attitudes among their faculty and students about business and industry and by training qualified high technology workers. The need for technological manpower in the sciences and engineering requires continuing the trend away from the humanities and social sciences.

Overall, the European countries are following a similar pattern to the United States, but by a different route, redirecting enrollments and resources away from the humanities and social sciences to engineering and the natural sciences. Among other things, they are concerned about their present dependence on foreign countries for information technology and services. The nations of the European Economic Community presently import 40 percent of their technology needs. They seek to foster positive attitudes about business and industry at their universities, want business-university partnerships, and encourage much closer ties between higher education and national economic development than ever before.

Russia

Neither the Soviet Union nor China should be overlooked in this worldwide movement driven by global competitiveness for economic security. The Chronicle of Higher Education reported on July 25, 1985 that Prime Minister Mikhail Gorbachev sees higher education playing a key role in reinvigorating the Soviet economy by introducing high technology and by training a new generation of industrial managers competent in the use of computers. Two months earlier the Soviet Politburo had raised the pay of research scientists to accelerate the pace of technological innovation in industry. According to Pravda, the raise is aimed at increasing "incentives given to workers employed in industry and research facilities... to introduce new technology and raise the quality of work performed."

China

China, too, is undertaking major reforms of its research and development infrastructure to make it more market-oriented. Chairman Song Jian of the State Science and Technological Commission which oversees research institutes says, in the future "the bulk of the research institutes, especially those concerned with technological knowledge, will have a market orientation." The goal is to link science and technology research more closely to economic development and to reduce government support for research over the longer term by replacing it with business and industry contracts.

NEW DIRECTIONS

The single, most effective approach to strengthening state economic development is for states to invest in education. Education in fact is the largest budget expenditure of the states. Business and industry are far more impressed with the quality of education in a state than with the glossy presentations and promotional packages offered by economic development agencies. So if states want to leverage their public monies to produce the greatest return, it is best done by strategic appropriations to enhance educational excellence which encourages business to invest and expand, thereby contributing to greater job creation.

And it is in higher education where the states can act most effectively as catalysts, leveraging their investments in scientific and technological research and training as the seed money to develop matching grants and contracts from industry. For the fiscal year 1985-86, the states are spending nearly $31 billion for higher education, the largest single source of funding for America's colleges and universities, outside of tuition. In just the last two years, state spending for higher education nationwide is up by 19 percent, more than double the rate of inflation during the same period.

While the states' investment in higher education has risen sharply over what it was during the darker economic years of 1980 and 1981, states' expectations of what they will get in return are rising as well. Though there is good reason to believe higher education is doing a good or excellent job overall, one cannot be certain because reliable, timely information is hard to come by. There is a lot of information about colleges and universities but much of it is self-serving and insignificant as far as what legislators need to know. It is then up to legislators to ask the right questions to find out what they need to know to judge whether public monies are being well spent. In other words, do the results justify the investment or can the money be spent in more productive ways? This relationship between state investment and quality and productivity of higher education is described in a 1984 speech to the American Association for Higher Education by John T. Casteen, III, President of the University of Connecticut and former Secretary of Education of the Commonwealth of Virginia. He says:

> To command the necessary support for higher education in a changed economy and with new constituencies making new demands, the colleges must couple improvements in the quality of their courses and programs, including improvements in services to industry, and services to the schools with requests for increased support. Absent linkage of this kind, we will miss the opportunity to move beyond pleas for help with damage control and toward command of both a greater share of available revenues and greater presence in state policy generally. The state should make clear its goals and priorities for higher education. Legislators can then weigh results produced against objectives sought. That is where the standards come for purposes of evaluation. The goals of course must be realistically stated and must be measurable. These are not philosophical questions. The state has finite economic resources to allocate and must award them in light of the

> benefits to be accomplished, the cost of the investment, and the competing opportunities for use of the money. These considerations are not moral absolute as some academics think but policy judgments weighing competing interests.

Higher education has become America's most critical economic resource. As a national resource, America's colleges and universities are unrivaled by any country in the world in terms of size, investment, and productivity. America's elementary and secondary public school system, however, is not superior compared to foreign school systems--it never has been. The real purpose of the reform movement is to make U.S. schools competitive with foreign schools, especially in mathematics and science. After nearly two decades of deterioration and decline, the nation is making an all-out effort to restore elementary and secondary education to its early 1960's level of quality. Though public confidence has risen in the past two years and SAT's are improving, pre-1965 standards are unlikely to be achieved before the end of the 1980's at the earliest.

Governors and legislative leaders commonly accept the importance of the linkage now between education and economic development as the road to competitiveness and jobs. Improving the quality of education remains a top priority for policy-makers in the states.

They need not, however, try to repeat for colleges and universities the unexpected success enjoyed by the public school reform movement in the short period since the publication of A Nation at Risk in March 1983. Economic conditions differ as well as the level of public awareness of the working of these more complex institutions of higher education. The public had become more critical of its primary and secondary schools than its colleges and universities. There was a greater sense of urgency about the public school system where 40 million students get educated each year - more than three times the enrollment of higher education. Actually, as early as 1979, public opinion polls turned the corner and began to rise in favor of higher education though not for the public schools. Public confidence in our colleges and universities has been rising ever since and is now at the highest point it's been in over two decades.

At the same time, it should be remembered that higher education more directly affects economic development and technological progress than the secondary schools. Public high schools send half of their graduates directly into the workforce, the other half enter college. It is in our colleges and universities, however, where the nation's young learn to think independently and critically about advanced subjects vital to a knowledge economy. That is where the fine minds are honed that produce the technological achievements in the sciences and engineering.

Governors and legislators act gingerly in dealing with colleges and universities. There are still lingering effects from the McCarthy era. They don't want to be accused of denying academic freedom or politically interfering in the internal academic affairs of institutions of higher learning. Nor are they secure about academics who defend their territories by claiming that issues such as curriculum, teaching, and research are too complex and specialized for untrained outsiders to grasp. As is so often the case in such matters, these are not either/or issues but rather a question of the right amount of interest shown consistent with responsibility for the use of public dollars. Senator Florence Robillard, Chairperson of the Senate Education Committee for the Vermont General Assembly, says, "my second priority for our educational institutions is that their actions must be accountable; my first, that they be accessible and my third, that they be acceptable to the marketplace." The question for elected officeholders is not whether they are spending the most money on higher education, but whether they are getting the most out of the higher education investment.

Rarely have major reforms or initiatives come from within higher education. They come from outside the walls of the academy because of social movements as in the 1960s or because of federal legislation as in the case of the Morrill Act of 1862 or the Higher Education Act of 1965. In an August 20, 1985 meeting of the New England Legislative Advisory Council, Massachusetts Representative and House Chairman of the Joint Committee on Education Nicholas Paleologos said, "The hard questions are not even being asked about higher education." Not a single legislator in the room dissented from this view.

To ask the hard questions, one must know the right questions to ask. Governors and legislators should both broaden their sources of information and require better information from higher education if they are to judge how well public monies are being used.

STRATEGIC PLANNING

The first question to ask of higher education is "where are you now," to be followed by "where are you going?" Every state system and every college should be prepared to answer those questions in concrete terms.

One limitation of college and university data presented to public officials is that the data are self-serving, much like those of any other institution or interest group dependent on government appropriations for its budget. Another is that college and university data are offered in support of sweeping mission statements too generally worded and too bland to be of much value to policymakers in evaluating achievement of objectives. What is lacking are strategic plans for institutions of higher education seeking public funds.

University plans should be linked closely with state economic development plans which set goals and priorities for their economies and should define the special role to be played by higher education with regard to the number and kinds of trained graduates to be produced and the varieties of research to be supported.

Such strategic plans are no attempt to dictate policy. Rather, they are practical arrangements to move away from cosmic generalities toward realistic assessments of strengths, weaknesses, priorities, and contributions to achieving state goals. The New England Board of Higher Education, through a broad-based special commission, established such a plan that won a broad consensus in the six New England states. The plan provides a comprehensive long-term perspective to the issues and specific recommendations for higher education's role in economic development. Pennsylvania, under the leadership of Governor Thornburgh, also prepared a strategic plan essential to the state's economic health. The two-and-a-half year effort enabled Pennsylvania to recognize the true value of its great research universities and overall higher education infrastructure, and to begin shifting from a traditional industrial base to advanced technology enterprises.

NEW EXPECTATIONS FOR HIGHER EDUCATION

A 1984 study of the attitudes of New England's legislators about higher education showed that one of their greatest concerns is getting better information. The independent New York-based Committee on Economic Development in a recent report also said, "Private industry could not succeed with a data-collection system and research base as weak as this nation has in the field of education." One can only wonder why education is so remiss in providing adequate data about itself when information is so readily available in other fields such as stocks and bonds, professional sports, and the economy. Perhaps this is because independently financed organizations, both public and private, collect the data in these other fields. Many different types of indicators can be developed by independent agencies but the cooperation of individual colleges and universities is critical because they are the source of the information.

Four approaches to improving the quality of information are offered as a start.

1. Annual Report of Performance

   Each state should use an outside group composed of prominent non-technical citizens, mainly business executives, whose companies are the greatest employer of college graduates, to judge how well higher education is meeting state goals. Scoreboards touting higher education achievements without disinterested, independent evaluation of performance serve only a public relations function, not a measurement purpose. Moreover, it should be remembered that state governing boards which provide information are not disinterested third parties which can be expected to report impartially on the system they govern.

   Colleges and universities provide information that is roughly equivalent to the approach of an annual report--it states their case. Look to independent third parties, public and private, for analysis, interpretations, and perspective. For example, France in May 1985 announced a new 15 member commission to produce annual reports on the performance of the nation's universities. Similar plans are being made to appoint an outside commission to report on major research programs.

2. Better Communication with Legislators

   Colleges and universities should be more candid, structured, and systematic in dealing with state legislators. Particularly in view of the high turnover of legislators, it is important to hold meetings with legislators periodically and not only at budget time, to discuss mutual resources, problems, and priorities. Over-reliance on centralized state boards of higher education for communication and information may actually impede more direct, informal communication between university educators and local legislators.

   In a May 1985 meeting of the Governor's Visiting Committee to the University of Maine with state legislative leaders, one of the concerns expressed by the legislators was legislative fuzziness about university governance. It was pointed out that legislators tend to let the University govern itself because they don't understand the chain of command. They think the university needs a tremendously increased presence before the legislature.

3. Informed Public Debate

   Both governors and legislators must raise the level of public awareness of the issues and priorities in linking higher education closely to economic development. In some states the issues are remote to the public; they remain the province of a select leadership who determine the future. In Massachusetts, for example, despite the remarkable success of Route 128 in sparking the economic renaissance of a decaying industrial state, Governor Michael Dukakis and the powerful Massachusetts High Technology Council still have sharply contrasting views of the economic world they live in and their visions of the future.

Dan Dimancescu, a technology consultant in Cambridge, wrote a "Dear Governor" column for the Boston Globe in June 1985 taking Governor Dukakis to task for "riding the crest of a high-tech boom without returning new seed for the next growth cycle." Dimancescu criticized the Governor's policies and inaction on higher education and new technology as evidence of a passive approach to building stronger economic foundations for the state. The issue was joined when John Hoy of the New England Board of Higher Education replied in a "Dear Dan" column later that month, strongly defending Governor Dukakis and describing his accomplishments in higher education. Hoy argued Dukakis not only raised Massachusetts from the bottom of the barrel in state financing to one of the largest percentage increases in appropriations for education during the last three years, but also that he acknowledged the impact of the broad educational base of Massachusetts' economic turn-around -- not simply in high-tech fields.

Regardless of who had the better arguments, the fact that these issues were singled out and debated raised the level of public understanding and produced a continuing dialogue. There is far too little of this going on in the states today, with the result that there is often a rush on to do something about higher education and economic development but too little time spent in building and maintaining public consensus.

4. Two Rarely Used Indicators

Of particular interest to the states but seldom provided to legislators are the states' comparative rankings for contracts and grants received per faculty member and research expenditures per faculty member. These have a direct bearing on the state's capability in research and development for technology innovation and the productivity of faculty.

For example, a small state like Vermont appropriates the smallest amount of dollars per student to public higher education, but it ranks 13th among all states in research expenditures per faculty member, fifth in instruction expenditures per student, and as high as fifth in contracts and grants per faculty member. No wonder higher education makes such a large contribution to the economy of the state of Vermont. On the other hand, it is not surprising that private universities and colleges in Massachusetts rank third nationally in research expenditures per faculty member and fifth in contract and grant monies awarded. But public institutions finish a dismal 50th for both these rankings. Whether this public-private imbalance in Massachusetts is a matter of conscious policy or the result of lack of information for policy-makers is unclear.

The proposals discussed in this section of the paper are meant to be suggestive. Many other indicators and improvements for better information can be devised by those concerned with higher education. The purpose is not to encourage new regulations for higher education but to assist state policy-makers in evaluating the long-term value of the public investment. Incentives such as tax benefits and special grants to encourage desired behavior would certainly help accomplish this objective.

Hard evidence to measure the health of higher education is grossly inadequate. If one wants to find out about the health of a publicly traded company, a wide array of financial reports are available from reliable, independent investment services such as Standard and Poor's, Moody's, and Value Line. To find out how a favorite major league baseball team is doing, simply open up the sports page to reams of statistics about the performance of the team, each one of its players, and its opponents as well. Why is it then so exasperatingly difficult to get timely, relevant data comparable over time indicating the yield of public funds invested in higher education? After all, colleges and universities are the most significant national depositories and transmitters of knowledge and information in our society--except perhaps about themselves. This may be an idea whose time has come.

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NEW ENGLAND BOARD OF HIGHER EDUCATION

THE PUBLIC INVESTMENT IN HIGHER EDUCATION

Report of
A Policy Briefing
for Legislators from

VERMONT

Senator William Doyle of Montpelier

A New England Project
Supported by
The Fund for the Improvement of
Postsecondary Education

Agenda

Policy Briefing for Vermont Legislators
Thursday, February 28, 1985
The State House
Montpelier, Vermont

Welcome

Senator Peter Welch
Senate President Pro Tempore

"Maximizing the Higher Education Resource in Vermont"

Melvin H. Bernstein
Project Director
New England Board of Higher Education

"Educational Attainment and Investment in Vermont"

John C. Hoy, President
New England Board of Higher Education

Discussion

Moderator

Sister Janice Ryan, President
Trinity College
Delegate to the New England Board of Higher Education

Panel

Lattie F. Coor, President
University of Vermont
Delegate to the New England Board of Higher Education

Hilton Wick, Acting Chancellor
Vermont State Colleges
Delegate to the New England Board of Higher Education

Senator George Little
Member, Committees on Appropriations, Natural Resources and Energy

The Public Investment in Higher Education

The following is a report of a special policy briefing held by the New England Board of Higher Education (NEBHE) in February, 1985 for Vermont state legislators. The briefing is part of a NEBHE regional economic development project on the public investment in higher education in New England, funded in part by the national Fund for the Improvement of Postsecondary Education (FIPSE). To guide this project, NEBHE has established a Legislative Advisory Council of leaders from the six New England states. A special policy briefing for legislators has been planned for each New England state. The briefing reported here is the fourth in a series of six. Briefings were held in New Hampshire in November 1983, in Rhode Island in April 1984, and in Massachusetts in November 1984.

New Vermont delegates to NEBHE, Florence Robillard (second from left) and Donald Chioffi (second from right) join Vermont NEBHE delegates Lattie Coor (left), president of the University of Vermont, and Sister Janice Ryan (right) president of Trinity College, Vermont, to meet with Vermont Governor Madeleine Kunin (center).

> "Today the educational attainment of the populace of any given state is the clearest measure, not only of its health as a society, but of the state's capacity to sustain a successful economy."
>
> John C. Hoy, President
> New England Board of Higher Education

Higher Education: New England's Natural Resource

Higher education in New England should be viewed as a unique natural resource. New England is more successful in attracting new college students to the region than any other section of the nation, primarily because of the excellence of its public and private colleges and universities. With 260 institutions of higher learning located in six states with a population of 12 million people, New England is the most knowledge intensive region in the country and probably in the world. The region has 50 percent more institutions of higher education per capita (and nearly twice as many private institutions per capita) than the nation as a whole. Higher education contributes substantially to the region's economy, in terms of direct expenditures and the educational and research benefits provided to meet the region's economic growth and development. In a recent NEBHE survey 86% of New England's legislators agreed that higher education is a major industry in the region.

Communication Between Higher Education and Legislatures

Question: Do you agree with the view that there is enough communication between New England's higher education institutions and the region's legislators on how they can help each other?

	YES	NO
Connecticut	22.4%	77.6%
Maine	20.2%	79.8%
Massachusetts	22.0%	78.0%
New Hampshire	20.7%	79.3%
Rhode Island	15.0%	85.0%
Vermont	41.0%	59.0%
Total	23.6%	76.4%

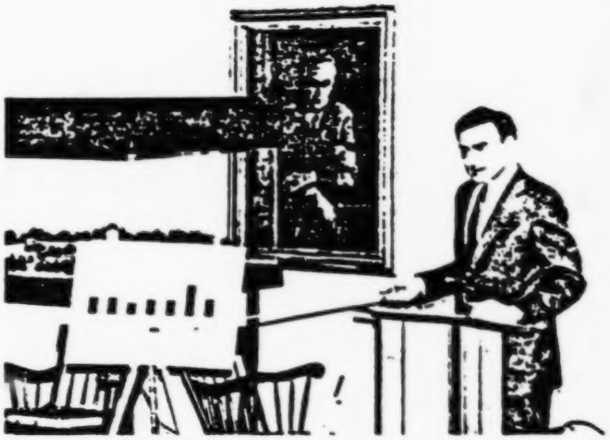
Findings taken from "Renewing Excellence: The 1984 New England Legislative Survey", sponsored by The New England Board of Higher Education

Vermont's Investment in Higher Education

Vermont has a considerable stake in the future of its institutions of higher learning. In fact, it can be said that higher education is more important to the economy of Vermont than it is to any other state in the country. Higher education can be considered one of Vermont's major industries.

"All of us in political life in the state of Vermont who have a concern about our economy and our communities recognize the essential importance of education; it is the linchpin of Vermont economic development. Without adequate education, you do not have people who are capable of doing the work that needs to be done, with the skills which allow them to obtain good jobs. Without an excellent higher education system, Vermont would be unable to attract the kind of industries that require and are dependent upon technological innovation."

Senator Peter Welch
Senate President Pro Tempore



"When you consider the state's resources, the amount of money invested, and what has been accomplished, it is fair to say that no state in the union gets a greater return from public investment in higher education than does the state of Vermont. Higher education's share of the gross state domestic product in Vermont is approximately 50 percent higher than the share of higher education in the rest of New England, and is again nearly double higher education's share in the economy of the United States overall."

Melvin H. Bernstein, Project Director
New England Board of Higher Education

Economic Impact of Higher Education

- The economic impact of Vermont higher education overall was estimated at nearly $500 million in 1982. This source of income is not only important to the quality of higher education in the state, but also to the quality of life available to Vermonters.
- The 23 degree-granting institutions in Vermont have a major impact on the state's economy. Half of the full-time student enrollment and 60 percent of the higher education tuition income is generated by out-of-state students.
- Vermont ranks fifth in the United States in government contracts and grants per faculty member; it ranks fifth in the country in instruction expenditures per student and it ranks 13th of the fifty states in research expenditures per faculty member. This investment in both research and teaching creates a dimension that should be extremely attractive to business and industry, particularly in the high technology field where a premium is placed on the availability of a well-trained labor force and innovative research and development capability.

John Hoy (NEBHE President) and Senator Little

> **"If you look at higher education as an industry, you realize how important the out-of-state students are, not only in maintaining the size of Vermont institutions, but in providing the revenue base needed to sustain our continued development."**
>
> Senator George Little

Government Grants and Contracts Per Faculty Member, Public Institutions New England States FY 1982

State	Dollar Amount	National Rank
Connecticut	$14,971	43
Maine	$20,817	20
Massachusetts	$11,794	50
New Hampshire	$19,183	26
Rhode Island	$24,279	15
Vermont	$35,058	5
U.S. Average	$20,472	

*District of Columbia included in ranking

Instruction Expenditures Per FTE Student, Public Institutions New England States FY 1982

State	Dollar Amount	National Rank
Connecticut	$1,882	49
Maine	$1,888	48
Massachusetts	$1,646	51
New Hampshire	$1,918	47
Rhode Island	$2,203	38
Vermont	$3,031	5
U.S. Average	$2,410	

*District of Columbia included in ranking

Research Expenditures Per Faculty Member, Public Institutions New England States FY 1982

State	Dollar Amount	National Rank
Connecticut	$10,931	42
Maine	$12,085	39
Massachusetts	$ 6,331	50
New Hampshire	$22,923	9
Rhode Island	$17,171	23
Vermont	$20,912	13
U.S. Average	$16,192	

*District of Columbia included in ranking

Source: "Higher Education Financing in the Fifty States", National Institute of Education and the National Center for Higher Education Management Systems, November 1984

Training the Workforce for Future Growth

The quality of the labor force in Vermont depends on the availability of training and continuing education programs for residents in response to industry's demands for new skills. Economic development is contingent upon an educated workforce. It is ultimately to Vermont's advantage that it concentrate on training or retraining its native workforce rather than looking to an in-migrating population to fill jobs requiring sophisticated skills.

Ronald Iverson and Lt. Gov. Peter Smith

High Technology Employment as a Percent of Total Nonagricultural Employment

	1983	National Rank
Connecticut	12.2	2
Massachusetts	11.5	3
New Hampshire	11.1	4
Vermont	9.6	7
Rhode Island	4.2	32
Maine	3.0	43
U.S. Average	6.3	

Source: *Monthly Labor Review,* U.S. Department of Labor, Bureau of Labor Statistics, May 1985

In the state of Vermont there are approximately 300,000 adults aged 25 years or older. Of this number, 90,000 did not graduate from high school. The opportunity and encouragement to continue their education is extremely important to adults who did not complete high school and to the economy of Vermont. Without sufficient education and training, the undereducated adult's ability to earn a living decreases as the momentum of the technology revolution increases, especially in the New England region, which has the nation's highest rate of job creation in the high technology field.

Years of School Completed by New England Adults 25 Years and Older, 1980 Census

	High School Graduate	College Graduate
Connecticut	70.3%	20.7%
Maine	68.7%	14.4%
Massachusetts	72.2%	20.0%
New Hampshire	72.3%	18.2%
Rhode Island	61.1%	15.4%
Vermont	71.0%	19.0%
U.S. Average	67.0%	16.0%

Source: U.S. Census Bureau

"The time has come for a state policy that will encourage greater numbers of adults to return and complete their degrees part-time. Forty-two percent of the enrollment in American higher education now comprises adult part-time learners. In Vermont, however, that figure is only 27 percent. The requirements of adults deserve increased attention from educators and state policy-makers alike."

John C. Hoy, President
New England Board of Higher Education

Vermont Places High Priority on Financial Assistance

Vermont's financing of higher education represents a high tuition/high financial assistance approach unique to the state. Tuition rates at Vermont public institutions are close to the highest in the country for both in-state and out-of-state students. However, the state, through the Vermont Student Assistance Corporation (VSAC), has made a substantial commitment to provide high impact financial assistance programs to students through the availability of grants and loan funds. In addition, the VSAC provides extensive information and counseling services, and administers an Outreach Program which serves economically and/or culturally disadvantaged high school students and adults.

Hilton Wick—Vermont business leader and higher education advocate

"Higher education makes an important and lasting impact on Vermont's economy, but we do not want to overlook the social and cultural contributions made by our institutions to the people of our state."

Hilton Wick, Acting Chancellor
Vermont State Colleges

While Vermont supports its public institutions at a level well below many other states in the country, the state fully recognizes its responsibility to provide those students in need the financial assistance to pursue higher learning.

- Vermont ranked 47th among the 50 states in FY 1985 in higher education appropriations per capita of state population.
- Vermont ranked first among the 50 states in FY 1982 in the percentage of its state higher education appropriations devoted to student financial aid. The state ranked second in the amount of state student aid dollars awarded per capita of state population. In both of these measures Vermont has ranked first or second over the past ten years.
- More than 8,000 full- and part-time Vermont students received Incentive Grants in FY 1984 from the Vermont Student Assistance Corporation to supplement federal and institution awards.
- In FY 1984, the Outreach Program administered by the Vermont Student Assistance Corporation served 5,288 Vermonters who because of their financial or social circumstances would otherwise be unlikely to continue their education past the high school level.
- Vermont ranked 41st in the percentage increase of its higher education appropriations over the past ten years and 27th in the percentage increase over FY 1983.

Factors in State Support of Public Higher Education, 1983–84

State	Appropriations per student (in dollars)	National Rank	Tuition per student (in dollars)	National Rank
Connecticut	3,972	13	519	50
Maine	3,086	46	1,609	7
Massachusetts	3,948	15	810	38
New Hampshire	1,925	51	2,576	2
Rhode Island	3,636	31	1,579	10
Vermont	2,450	50	3,520	1

*District of Columbia included in ranking

Source: "How States Compare in Financial Support of Public Higher Education 1983–84," National Institute of Education.

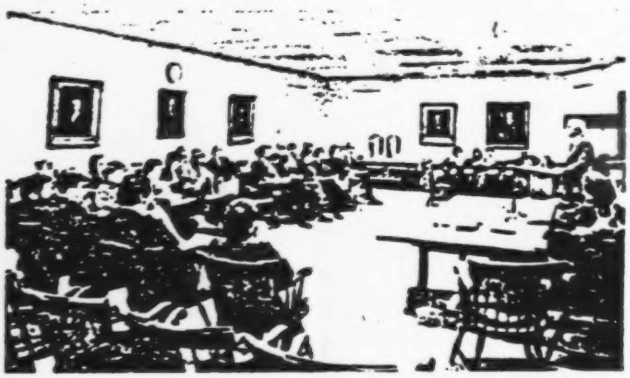
Interstate Cooperation: The Regional Student Program

A regional poll co-sponsored by NEBHE revealed that a clear majority of New Englanders favor greater interstate cooperation at all levels of higher education in order to reduce costs, increase academic options for students and at the same time avoid duplication of programs in adjacent states.

NEBHE's Regional Student Program (RSP), in operation for 28 years, continues to be a model program of interstate cooperation which increases educational opportunities at the postsecondary level. It enables residents of the six New England states to enroll in out-of-state public colleges and universities within the six-state region at reduced tuition rates for degree programs not available at their home states' campuses. The program is the largest of its kind in the United States.

"Higher education institutions must cooperate more with each other to provide students with better services, especially in rural areas. We have to give up some of the turf lines among various institutions and the traditional notion of who does what where in order that students' needs are well-served."

Governor Madeleine Kunin



With 348 in-migrating and 535 out-migrating students, Vermont remained a net exporter of RSP students in 1983–84. The in-migrating RSP population increased by 11 percent, with those students taking advantage of 51 percent of the programs available to them in the Green Mountain state. Out-migration rose 12 percent since 1982–83, with Vermonters enrolled in slightly under 30 percent of available out-of-state programs. Residents saved an average of $2,012 in tuition under the program. Estimated total Vermont savings rose 10 percent in 1983–84, to $1,076,319.

Half of Vermont's outgoing RSP students enrolled in New Hampshire's two-year vocational colleges and institutes and various community colleges in Massachusetts. The doctoral degree program in Education at the University of Massachusetts at Amherst enrolled the largest number of Vermont residents at the university level. Meteorology at Lyndon State College remains the most popular state college program offered through the RSP, and attracted close to 18 percent of the total in-migrating population.

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Senator
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July 1985

PARTNERSHIPS, HIGHER EDUCATION, AND ECONOMIC DEVELOPMENT

Over the past decade there have been increasing number of successful partnerships between higher education institutions and a wide range of businesses and other organizations. This paper is an attempt to review the advantages of effective partnerships between higher education, business, labor unions, and governmental entities that grow out of the Education and Economy Alliance.[1] This paper will also review strategies useful in the creation and maintenance of these effective partnership and make policy recommendations for higher education institutions which would encourage these kinds of partnerships. Ultimately, partnerships between higher education and other groups lead to a more efficient use of resources and a wide range of activities that will enhance economic development and offer benefits for higher education, businesses, labor unions, and governmental entities.

The following is a discussion of the benefits to each of these constituencies.

Why should higher education be interested in partnerships?

Given the decreasing income for most institutions of higher education from traditional revenue sources, most higher education institutions are interested in new and innovative sources of income. Partnerships with business, labor unions, and governmental entities encourage more productive use of existing resources and often times lead to providing new services in innovative fashions which create new revenues.

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[1] The Education and Economy Alliance is a project of the National Institute for Work and Learning which was supported under Grant Number G 008440477 from the Fund for the Improvement of Postsecondary Education.

One of the difficulties most higher education institutions are faced with in a period of rapid technological change is a need to be able to acquire state of the art equipment and to stay abreast of changing technologies. Partnerships encourage the acquisition and/or mutual utilization of equipment and new technologies.

Given the difficulties of keeping faculties abreast of the changing technologies or in acquiring new faculties which are updated in the state of the art equipment and techniques partnerships encourage the mutual sharing and updating of existing faculties. Shared equipment, resources, technologies, and faculties create cost effective approaches.

Innovative partnerships between higher education, business, labor unions and governmental entities provide a wider rage of access to the community. This leads directly to an increased awareness of the expanding role of higher education. This leads indirectly to an increased awareness of and valuing of that institutions' activities in promoting economic development.

Partnerships working with high technologies and updated techniques can lead directly to revisions of curriculum and timely programs so that they are more current.

Higher education institutions have not traditionally had extensive feedback systems in place to evaluate the effectiveness of their education activities on their students in terms of student success in the work place. Active partnerships between higher education, business, labor unions, and governmental entities will encourage immediate feedback on the success of a wide range of higher education services and educational activities. This feedback if utilized by the higher education institutions can lead to much more relevant services and curriculum.

As the market place for traditional higher education students shrinks drastically due to demographics and societal changes, most higher education institutions have over the past ten years been increasingly looking to new markets for new non-traditional students. Partnerships between higher education institutions, business, labor unions, and governmental entities allows colleges to become more familiar with the needs of a wider range of individuals in our society and can allow for the development of new services and curriculum to meet those needs. The result has been an increase in the number and types of non-traditional students.

Why should business be involved in a partnership with higher education?

Business has a continuing need for well educated, motivated and highly skilled workers. This need has been accentuated with a rapid amount of change occurring at all levels. Business involvement in partnerships with higher education institutions can encourage and support the creation of a better educated, more motivated and technologically skilled work force.

Higher education institutions and business have commonality of interest around research and developing new technologies, products, and services. Successful partnerships can lead to immense benefits for both.

Given the need of business for on-going development of its human resources, cost effective training and services provided by higher education can have a direct impact not only on lowering the cost of these activities but on providing quality training.

Partnerships with institutions of higher education provide business with access to specialized people with specialized expertise in order to meet businesses's on-going needs.

In a rapidly changing high tech world it is absolutely essential that technology transfer occur between higher education institutions and business. The creation of high technology, its development, and the training and educating of people to effectively manage this technology is a common interest and can best be facilitated in a relatively cost effective manner by creating partnerships between higher education and business.

Partnerships between higher education institutions, business, labor unions, and governmental entities provide access to new money to assist business and higher education in the development of technology for the improvement of business operations in the hiring and training of workers. The ultimate result of this new access to money is to facilitate the creation of economic development through new and expanding businesses.

Economic development coming about from the successful operations of partnerships leads to the enrichment of the quality of life for all residents. New companies as well as existing companies functioning at higher levels create more jobs, a better skilled, and a more motivated work force. All lead to a better community. This results directly into more success for higher education institutions, business, labor unions, and government entities.

People feel good about organizations that are involved in successful partnerships. Higher education institutions, business, labor unions, and government entities all find their operations to be simpler and more productive when they have the strong support of the people in their communities. Most businesses are aware of the need for corporate involvement and corporate responsibility in the affairs of the communities in which they operate. These kinds of partnerships create a high impact and successful method of corporation to demonstrate their corporate responsibility. This also makes sense in terms of economics and the bottom line considerations of corporations.

Why should unions be involved in a partnership with higher education?

Since the late 70's unionized workers have come under increasing threat as old companies close or modify the way that they go about doing business. International competition, new technologies, new patterns of business have combined to decrease the security levels of many union workers. Working in partnership with business, education institutions, and government would help ensure against the effects of rapid turbulent world wide technological changes by the creation of programs to upgrade or increase worker competencies.

More opportunities would exist for the development of new skills. Programs developed by these new partnerships would give workers the opportunity to learn new skills and increase their competitiveness in the world market place.

Many workers currently feel a sense of helplessness about their situations as technological and competitive changes increase at a rapid pace in our society. Partnerships between higher education institutions, business, labor unions, and government entities should increase the workers' involvement in developing their own coping skills. Understanding what is happening will allow them to work smarter. Being actively involved in their own development will encourage them to develop a higher level of motivation. The ultimate result of this is better workers, better companies, and a better society.

As workers return to school they will be exposed to diverse cultures, new technologies, and a variety of new experiences. Many workers who are reluctant initially to get involved in education because of past experiences react very favorably to these experiences when they feel they are helping themselves develop new competencies.

Encouragement of partnerships between higher education institutions, business, labor unions, and government entities will help labor leadership ensure the survival of the movement and they may be perceived as progressive leaders. In addition, by being actively involved in these programs, labor leadership will have more input into educational training activities and more input on upgrading the living standards for all their membership. Increasingly, labor has initiated contracts with their companies to spell out the kinds of progressive activities they would like to see provided their membership. Many of these focus on human resource development and educational activities geared at developing the workers so they can cope effectively with the changes in society.

Why should states enter into partnerships with higher education, business, and labor?

Successful partnerships between higher education institutions, business, labor unions, and government entities provide the kind of activities that ultimately result in economic development. These partnerships create new organizations which translate the new technologies into marketable products and services. These partnerships assist in the expansion of businesses to successfully handle these technologies in the market place and the development of workers to successfully work for these organizations. This results in highly successful companies and more and better jobs for people. In turn, this leads to more income for states.

Assisting companies with the creation of new and successful companies leads to more and better jobs. Workers who are educated, motivated, and skilled in these companies reduce the number of individuals that need services from government entities.

Partnerships utilizing shared resources and shared expertise leads to a more efficient operation of public education institutions. Successful companies that are growing are creating goods jobs, which means that there is more revenue available at all levels for government entities. Successful partnerships that demonstrate that they can facilitate the creation, transference, organization, and utilization of technology result in expanding companies or new successful companies which hire highly educated, highly motivated, and highly skilled workers in good jobs will dramatically improve public support of all of the partners.

Strategies to create and maintain effective partnerships.

New partnerships can be perceived as a threat by members of existing organizations. The benefits of partnerships far outweigh the cost. Initially there are a number of things that can be done to effectively facilitate the creation of new partnerships. Some sensitive areas in the initiation of partnership include the following:

1. Each partnership has its own culture

There is a certain amount of inertia in most organizations. Forces and procedures exist which can block new partnerships. These need to be identified and managed in such a way that the partnership can be successful. Sometimes messages are sent by the way and the type of individuals selected within the organizations that will be responsible for these new partnerships. Care needs to be taken to ensure the individuals selected are flexible enough to work outside usual boundaries. Any organizational changes that result from the establishment of these partnerships also sends messages to the existing organization as well as the other partners and the community about the importance, significance, longevity, and ultimate benefits of this partnership.

2. Mutual definition of problems

For the initial stage, the mutual definition of the problems for all parties of the partnership is essential. Successful outcomes need to be defined and agreed upon. Each of the parties of the partnership need to have a sense of how they will know if the project is successful. Negotiated mutual agreement on the measures of outcomes from the beginning will reduce misunderstandings in the ambiguous situations that often follow the initiation of new partnerships. In starting a partnership it is helpful to clarify the commitment that the organizations and the individuals within the organizations are making. How long do they expect to be committed? How much time or energy?

What level of people will be involved in the partnership. What kinds of resources will be contributed between partners?

3. Institutional change

Partnerships will eventually change institutions. Not all of these changes are predictable. It is helpful to keep a clear sense of the institution' mission of each of the individual organizations and in which direction each institution would like this partnership to change their organization. It is best to start with the highest level of leadership in each organization as is possible. Working top down on new partnerships is most effective. Often times informal agreements may need to be in existence for an extensive period of time before a similar formal agreement, if any, may be developed. Successful partnerships stress trust and open communication between its members.

The advantages must be real, the problems significant, the successful outcomes important to each of the participants. Successful partnerships create energy. One of the ways of doing this is to encourage each of the partners to celebrate ownership of the outcomes. Everyone gets credit.

4. Maintaining partnerships

After the stage of initiating a partnership comes the task of maintaining the partnership. Successful partnerships have a number of qualities: They remain flexible and adaptable to change even though the problem were identified at the start as were the measurable outcomes. Partnerships evolve faster than existing entities. To be successful they must be encouraged to do that. Multiple sources of funding often times are desirable so that the partnership can maintain some independence of mission and not be captured by one funding source. Communication should be frequent with a high level of interaction account the successful achievements or goals of the partnership. Regularly scheduled meetings are important but again, agendas must be for real and it is helpful to remain very conscious of the limits of time and resources. As the partnership evolves new long term and short term goals will need to be continuously negotiated, defined, and mutually agreed upon.

This paper concludes with five policy recommendations:

1. Higher education institutions, business, labor unions, and government entities should encourage the clarification of their institutional missions so there is emphasis on initiating partnerships for economic development.
2. Joint ventures between higher education institutions, business, labor unions, and government entities should be encouraged.
3. Joint funding using resources from higher education institutions, business, labor unions, and government entities should be encouraged to support partnerships.
4. Encouragement and the provision of economic incentives for successful partnerships should come from higher education institutions, business, labor unions, and government entities.
5. States should encourage higher education institutions and businesses to have a part in developing and implementing economic development goals.

ECONOMIC LITERACY

OVERVIEW

Among many of the projects involved in The Education and Economy Alliance,[1] economic literacy is a common thread. Despite different audiences and types of projects, most programs must grapple with the need to educate their participants about the economic nature of the world around them. In some projects workers learn about employment trends to help them with their job search, in others, workers begin developing an analysis of how global trends will affect their job or the industries in which they are employed. Some projects work with students and teach them about the the interaction between technological development and economic change. In all these settings there is a recognition that workers, students, and community people must be knowledgeable about economic concerns in order to make rational and effective decisions about the future.

Despite the common need for more opportunities to learn about the economy, elements of economic literacy are not regularly included in postsecondary education offerings. This trend is changing as more employment related classes now include information on the labor market and unemployment. Similarly, many workplace and union sponsored classes provide information on industry-specific and global trends affecting certain sectors of the economy. Farm management and marketing classes also are more likely to look at international trends and domestic economic changes as part of the class activity. These activities, however, affect only a small number of adults.

The Alliance identified a need for state level planners and policymakers to understand the need for economic literacy so that programs addressing this need could be made available to larger numbers of people. This need becomes increasingly more critical as more states and institutions are pushed into forming new partnerships and agendas, particularly with the private sector.

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CONTEXT

Our notions of literacy are frequently redefined. Earlier criterion for determining a person's literacy level was the ability to write one's name. Literacy has evolved since then to keep step with the increasing complexity of everyday life. Recent redefinitions of literacy include critical thinking skills and electronic and digital information management skills. The report on the crises in American education, A Nation at Risk, confirmed the need for including these new skills in the definition of literacy.

The definition must again be broadened to include economic literacy. Like critical thinking and information management, economic literacy reflects the need for increasingly sophisticated knowledge regarding the role of the economy among the American populace. Since American workers now face job retraining and job change as a matter of course in their work lives, they need to understand how the job market is affected by various trends in order to be effective in their life/work planning. Not only individual workers, but entire communities also find their future in jeopardy as a result of economic changes. Community members require information and the skills to use that information to plan successfully for the future. Finally, economic realities impinging on political decision making require an increased level of understanding on the part of the American electorate.

Economic literacy skills are more critical than ever before. The American economy is in constant transition, but in the last several decades these changes have taken place at a much faster rate. For example, one of the most dramatic changes is the decline of heavy manufacturing and primary industries. Many areas of light manufacturing including shoes and textiles have also declined as a result of the transfer of jobs to countries with lower labor costs. The most rapidly growing segment of the labor market is the service sector which now employs about 28% of the workforce. While heavy manufacturing once was the most productive sector of the economy, information management now occupies that spot. These changes have meant a decline in the number of skilled long term jobs which are being replaced in smaller numbers by low skilled, low-paying, and short term employment in the service sector. This trend is partially responsible for the increase in small business development. In some rural states, such as Idaho, small business accounts for over 90% of all new jobs. Individuals and communities must be able to find their place in these new environments.

These developments result from the interaction of a variety of complicated factors, many of which are directly attributable to political decisions and other areas over which individuals and communities have some power. Budget deficits, trade imbalances, the export of capital to employ cheap labor elsewhere, and tax structures all play a role in determining the viability of both jobs and communities. In addition, the growing importance of technological developments and international relations raise critical questions about the quality of life and about war and peace. Informed participation in these arenas is becoming both more essential to our way of life and more important to critical decision making at all levels on issues ranging from finding work to supporting large economic development projects.

ECONOMIC LITERACY: SKILLS, INFORMATION, AND A PROCESS

Economic literacy programs provide participants with information, teach them skills, involve them in a process of developing and using information, and expose them to alternatives. Successful programs combine information giving and skill development with a process that helps individuals to learn how to access information and how to use that information to plan effectively for change.

Information

Information about the economy provides students with the building blocks for developing economic literacy. This information should include an introduction to the basic terminology used by the media, in public policy statements, and in many of the reports with which students come in contact. Basic economic data, particularly the information that is used to convey to the public what the current trends in the economy are is also important as is information on those industries that touch on the lives of students most directly. Finally, some basic knowledge of consumer economics should be included in the basic building blocks.

Facts alone are not enough, however. Students must also have an opportunity to learn about the economy in such a fashion as to increase their conceptual understanding of the global character of the economy and how that affects local, regional, and national economies.

Skills

In addition to information about the economy, economic literacy programs need to include some opportunities for skill development. These skills fall into three categories. Occupational/job related skills are necessary for individuals to function successfully in the work world as workplaces and relationships among workers and on the job change. Students also need to develop skills in researching, accessing, processing and analyzing information. Finally, skills necessary for group participation in economic planning and development and in group decision-making should be fostered in economic literacy programs. These skills provide the mortar that makes it possible for participants to use the information they have learned.

Process

Often economic literacy programs are developed around information giving and skill development alone. Successful economic literacy programs must also engage learners in a process of learning to use that information. Therefore, economic literacy classes must be learner centered and be organized around relevant and useful economic concepts. Student and community concerns have a place in these classes.

The method that we think will be most useful in developing a learner-centered classroom is that of participatory research. Participatory research is an integrated approach that combines research, education, and action around issues deemed important for a community, workplace group, or other collectivity. Central to this approach is the conviction that residents or members of these groups can learn to define issues, do most of their own research on those issues, educate each other, and participate in collective activities to design ways of coping with economic change. The process approach to teaching computer literacy, for example, helps participants develop a blueprint for making the best use possible of their new knowledge and skills.

In the communities in which we work, we use this process to identify and analyze the varied resources that the community has, to look at how larger economic forces affect their utilization, to identify possible options for local economic development efforts, to make choices as to what might be the most desirable/feasible alternatives, and to develop possible strategies for implementing the most appropriate alternatives. The method provides a means for including as many individuals as possible throughout the process.

WHY ECONOMIC LITERACY IS IMPORTANT

Programs presenting economic literacy are important for three main reasons:

1. The electorate needs the background to make informed decisions.
2. People need to understand the current trends in our information society to plan their work and home lives.
3. Communities and states need to address economic distress and growth more effectively.

When current information is available, individuals and groups can develop analyses to help plan for the future.

Economic Literacy in a Democratic Society

An informed electorate is essential for the continued existence of a democratic society. Increasingly public policy decisions require sophisticated information on economic trends in order to make effective policy. Voters need this kind of information so they can evaluate candidates' platforms and act on possible policy decisions. In addition to learning about economic trends, the people also need to be exposed to different analyses of how the economy works in order to interpret data on existing trends and to predict future outcomes. In sum, there is a need for informed participation of the public in decisions about economic policy and its implementation.

We live in a democracy, and if we take that at all seriously, we must realize that economic changes and decisions associated with them dramatically affect the lives of individuals and communities. As such, they should be amenable to democratic decision-making. To take that argument one step farther, the internationalization of our economy has changed the parameter of decision-making. In this context, economic literacy should be a criterion for global citizenship.

Economic Literacy in the Information Age

New developments in technology impact our need for information. As technology development quickens the pace of change, individuals need to be able to act quickly to plan ways of meeting that change. Policymakers also must be able to extrapolate trends into the future to develop effective policy.

Not only has the need for information changed, but also the role information plans in our society has changed. The sector of the economy that deals with information is growing rapidly. In addition, information has become a valuable economic asset. Individuals and communities need to learn how to access, evaluate, and process information. Programs in economic literacy can provide skills to cope with the new society, particularly through empowering people to use information in their own interest, learning to use economic information to plan for the future, and developing foresight to act decisively now.

Economic Literacy and Community Development Concerns

While the structure of the national economy may be changing, the efforts to enhance local and regional economies have remained basically the same. Historically, many efforts at economic development have not been as successful as we have been led to believe. The continuous focus on recruiting new industry to an area so that residents can achieve a higher standard of living has led to a mirage effect that clouds the underlying reality of continued economic decline. For example, despite successful efforts to recruit large industries, the Appalachian Region has lost two and one-half manufacturing jobs for every one it gained during the 1970s. The Raleigh News and Observer in August, 1981, noted that thirty-five years after Governor Robert Gregg Cherry launched a vigorous campaign to attract industry to the state, North Carolina still ranked forty-first in per capita income. The emphasis on smokestack or microchip "chasing" obscures the real cost of investing in that strategy to residents of that region. Programs which provide information and skills to use that information can help communities analyze the costs and benefits of a variety of economic development strategies so that a plan to implement the most effective method of bringing jobs and economic growth can be developed.

Educational programs on economic literacy can also expand the arena of decision-making about a community's needs and economic planning to include a wider range of participants. Currently, the set of actors most likely to be involved in planning and development is the group commonly associated with the Chamber of Commerce. Wider popular participation in community planning can increase community support for a given strategy and insure that one segment of the community does not benefit at another's expense.

Economic Literacy and Work

As the economy continues to change at a rapid rate, many workers fall victim to structural unemployment. Others find they must make major career changes periodically. Indeed, it has been estimated that 20% of American workers change jobs every year. Information to facilitate making critical life decisions in this context is essential for both workers and society. In addition, individuals will also have to make different kinds of decisions in the context of the workplace as new forms of ownership, management, and co-management emerge. These decisions require some expertise in analyzing trends and extrapolating the consequences of decisions.

STRATEGIES FOR IMPLEMENTING ECONOMIC LITERACY

Economic literacy programs can evolve out of a variety of milieus. Communities concerned with economic development have offered classes as have unions interested in helping their workers more effectively cope with change.

From the point of view of the Alliance, an ideal strategy for implementing economic literacy programs would be for states to undertake coordinating a system for delivering such educational programs and to underwrite the initial cost of development. Such an activity would support policies for economic development because a knowledgeable population would become more effective partners in economic development projects. The FIPSE sponsored Economics Education Project of the Highlander Research and Education Center gives classes on economic literacy to community groups who then use what they have learned to improve local planning efforts and to increase local participation.

A variety of potential providers exists within every state. Overall coordination and development of an economic literacy incentive could bring in vocational education providers, businesses, unions, and community education groups in addition to traditional postsecondary education institutions. Long-range planning would eliminate potential overlap of programs and ensure more effective use of resources.

An example of an economic literacy program within the workplace context is the FIPSE project at Boston College. Working closely with union leadership in sunset industries, faculty in the sociology department are developing courses to teach workers about economic change. West Virginia Institute of Technology through its FIPSE Postsecondary Adult Literacy Education Project has provided information on economic literacy in classes geared to workers and their families. This information has been helpful to participants in understanding the factors influencing the decline of many of the industries in the area. It has also provided information on alternative forms of corporate ownership and worker involvement in planning for future economic development.

Successful economic literacy programs also exist on the community level. In Dungannon, VA, community members have met together to learn more about the national and international trends that affect the local economy. They also have the opportunity to discuss a variety of economic development strategies and plan ways of implementing those most appropriate to their situation. In another example, the Northern California Higher Education Council has provided assistance to several rural communities in northern California. Working with community groups, the Council has helped residents identify alternative economic development strategies and to plan ways to increase local revenue through expanding programs in tourism. Similar efforts exist in several Idaho communities as a spin-off of the FIPSE supported READI project.

SUMMARY

Economic literacy programs are beneficial in a number of ways. An educated constituency is important for the democratic functioning of this society. Workers who have an understanding of economic trends will be able to make more effective decisions about their future. Communities developing plans for economic development can draw from the local population for support and resources. Critical to the success of economic literacy programs is an understanding that economic literacy is a lifelong pursuit. Implementing economic literacy education programs requires cooperation among a variety of educational providers, businesses, unions, workers, and community members.

RENEWING SCIENTIFIC/TECHNICAL CAREERS

By William Charland and Celia Marshak

Martha began her career in geophysics as a landscape painter. She grew up close to the Delaware shore and, as a teenager, loved to spend weekends painting watercolors of scenes along the beach. The time was 1960 and much of the shoreline was still unspoiled. Then a few developers appeared, hotels went up, and quality of the environment became a heated issue.

Once in college, Martha decided to put her artistic interests aside and do something about saving the shore. She majored in environmental studies and gained a good introduction to earth science and a variety of other subjects. But professionally the degree led nowhere. And so she went on for a graduate degree in geology.

Last year, as an exploration geophysicist, Martha earned $60,000. Her record of accuracy in finding productive oil wells was several times the average. Martha's success derived from many factors, and among them was her intuitive, almost artistic approach to a specialized field. While Martha had a strong technical background in geophysics, she had maintained another perspective on the field. She recognized that geophysics was something less than a hard science; taking facts at face value led to a lot of dry holes. Geophysics actually provided her a way of looking at the environment, much as painting did. So she learned to use geophysical data as an instrument to envision the earth's substrata.

This year, Martha is trying to employ her intuition and intelligence in new ways. For the American oil industry has collapsed and she has lost her job. She is anxious about the future, as are thousands of her colleagues who also are out of work. But she has entered a program of career counseling and begun to explore new ways to apply and develop some of her broad-ranging skills.

Martha's future course is still unclear but, based on her characteristic creativity, it appears promising. Many of her peers are not as fortunate. Highly trained in narrow specialties, they have seen the skills of a lifetime become unmarketable in mid-career. Often they react in shock. "This is all I know!" they say.

This article explores the distinctive needs of scientists and other technically specialized professionals in mid-career. It emanates from two university-based programs supported by the U.S. Department of Education's Fund for the Improvement of Postsecondary Education. The article is addressed both to mid-career scientists themselves and to educators who work to assist them. Following an overview of employment change in the United States, career counseling materials for assessing and communicating transferable skills are presented. The final section describes academic advising procedures in relation to career management needs.

Those who are offered as case examples are geoscientists and biologists: two professions that require specialized training and in which employment conditions and opportunities have changed radically. We emphasize these fields because of their prominence in the labor markets of Denver and San Diego; we have extensive experience with these specialists and their changing needs. But in addition, we believe that the circumstances of these professionals represent those of many others whose working lives are affected by volatile market conditions and technological change.

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How Jobs Change Today

Employment change is endemic in today's American economy. Each year, about one-third of American workers leave their jobs (Naisbitt, Reinventing the Corporation). 1980 data indicate that the average worker spends 3.6 years in a job--down from 4.6 years since 1963 (Reich, The Next American Frontier, p. 163).

Some of the reasons Americans change jobs derive from personal need. Studies of adult development identify regular patterns of change--growth rhythms--in the lives of adults (Levinson, The Seasons of a Man's Life). Individuals differ in their needs for novelty and new sources of stimulation--some people such as Martha may need an exceptional degree of innovation--but most people seek something other than a one life/one job equation. The motives for career change may run deep.

Charles is a scientist in his mid-forties. An internationally known geologist, he has taught for 15 years in a large American university in the West. The school is located in an exceptionally beautiful city and Charles has enjoyed his tenure there. Many of his summers have been spent in the Canadian Arctic tundra, conducting field work. Both settings are far removed from the streets of Manchester, an economically depressed manufacturing city in northern England where Charles' father spent his life as a "fitter and turner" for the railway.

For the past few years, Charles has found himself wrestling with an inner need to "move on." Part of his restlessness derives from his working class background. Charles has a strong sense of having escaped from Manchester. Often, as he attempts to help his family and friends still there, he worries about what more he might do; unemployment there is now 20 percent.

But he also has been questioning life in academia. Charles had been hired by his university with several other promising researchers to develop a new "center of excellence" in Arctic studies--part of a concerted effort to bolster the school's reputation. Since then, funding has declined and the university's priorities have changed. Charles has found himself in a much less promising environment.

Last year, after completing a program of vocational interest tests, he decided to take a sabbatical year away from the university. Then he discovered an intriguing opportunity to explore the field of international marketing. His stockbroker introduced him to a small engineering firm, founded by a remarkable inventor who has spent his life creating, though not marketing, a series of revolutionary technical products. Charles found many of the inventions impressive, but especially was intrigued by a unique dome-like structure, many times larger than the geodesic variety. Charles recognized the value of such a dome in the Arctic where it could house whole communities and reduce isolation and climatic stress.

As he learned of other products and shared his own international experience and interests in marketing, Charles and the inventor began to explore a trial venture. Charles offered to arrange visits with acquaintances in a few universities and firms in Britain. Following several successful trips, the inventor asked Charles to serve as his International Marketing Manager.

Today Charles divides his time between his old career and a potential new one. While continuing to teach part-time, Charles is learning the field of international marketing. He finds it far less secure than academia. But it is a growing field, and it reawakens the sense of challenge he once felt in emigrating to the U.S. and exploring the Arctic.

One new challenge is to develop a site for manufacturing some of the inventor's products. Charles is well-acquainted with a place where unemployed skilled workers abound! His next trip is to Manchester.

Many mid-life career decisions are that personal. Yet today much of the motivation for job change arises from extrinsic factors. As sociologist Daniel Yankelovich has observed, for most Americans in the 1980s matters of economic survival have begun to take precedence over questions of personal growth. "In a matter of a few years," he writes, "we have moved from an uptight culture set in a dynamic economy to a dynamic culture set in an uptight economy." (New Rules, p. 19.)

Part of the reason so many Americans change jobs so often is that occupational roles themselves are changing. Colorado Governor and futurist

Richard Lamm has estimated that one-third of the job roles important in the near future do not now exist. That figure probably is not far off the mark.

Five primary factors influence labor market change:

(1) *Economic conditions*, such as growth or decline in demand for a particular product or service.

(2) The introduction of *new technology* (such as the computer) and its application to new fields (such as accounting).

(3) *Political/public policy changes*, such as deregulation of certain industries, or a concern to balance the federal budget.

(4) *Demographic changes* - within an organization, as when key staff members retire; or on a broad national scale, as when children of the "baby-boom" generation enter elementary schools.

(5) *Value shifts*, such as interest in the roles and status of women, or in the quality of the natural environment, or a belief that health care services should be offered for profit.

Each of these factors may be powerful independently; but, combined, they may give rise to exponential, rapid rates of change which can threaten other human values. (See Charland, 1979, 1986.)

The energy industry downturn of the mid-1980s, for example, results from changes in (1) economic conditions of declining demand for petroleum related in part to (5) value shifts toward energy conservation, (3) in a domestic political atmosphere of deregulation.

The length of this industry recession will be influenced by (3) political conditions in the Middle East where (5) Islamic fundamentalism represents strong indigenous values, and (2) the continuing growth of electronic technology whose energy requirements are only 1/100 those of the passing industrial manufacturing-based economy.

Many of us today accept rapid technological change as implicit in the economic nature of things. So, for example, Robert Reich writes in *The Next American Frontier*:

> The only way industrialized nations can increase their citizens' standards of living in the future is to concentrate on the high-value niches within [traditional] industries and *to seize and keep world leadership in new industries based on advanced and emerging technologies*.... Japan understands this future. So, to a lesser extent, do West Germany and France. They know that *economic success will depend upon* the *speed* and appropriateness of their shift in production.... Governments and businesses in *these nations therefore are racing* to gain sophistication in these new sectors.... (P. 231, emphasis added.)

Today, as a global community, it may be advisable to reassess rampant technological change in relation to other goals. We might remember with Gandhi that "There is more to life than increasing its speed." But in the meantime rapid change permeates our culture and impacts individual lives.

Rampant technological change complicates career management: the process of directing the course of one's working life. Problems of career management are compounded in the case of individuals whose progress through life depends on highly specialized skills. For example, while it is difficult to generalize among scientific fields, the instrumentation one learns in these fields through formal academic training probably has a state of the art generation of about five years.

Many workers in specialized fields such as the geosciences and other natural sciences, and in engineering careers, update and renew their technical knowledge on the job. Inhouse workshops, professional meetings, and the training that customarily accompanies the introduction of new technology all can create a working environment in which lifelong learning occurs as a matter of course.

But others have a harder time staying current in technical fields. Some organic chemists working in industrial environments, for example, may use synthetic procedures far different from the specialized techniques needed for synthesizing biopolymers and other molecules important to frontline research and development in biotechnology.

And, of course, those who change careers or who re-enter their original fields after a lengthy absence may return to a foreign land where new technologies are employed and strange languages spoken.

* * * * *

During the mid-1980s, the career paths of many earth scientists have been radically disrupted. The energy industry in America has been affected, as we have seen, by a number of factors, and thousands of individuals such as Martha suddenly find themselves out of work.

For many geoscientists in Denver, the industry's collapse is complicated by the prospects of its return. Denver is the center for energy-related commerce in the "Overthrust Belt"--a field of oil reserves where drilling is relatively expensive. While today production in the Overthrust Belt is down and even exploration has slowed to a crawl, there is every expectation that at some time in the future the local energy industry will recover and employment opportunities for earth scientists will return. According to Joel Garreau (The Nine Nations of North America), that is the reason Denver is "overbuilt." During the 1980s, as the downtown business district virtually doubled in size, the vacancy rate for commercial properties ranges between 33 and 50 percent: the highest in the country. Why the anomaly of new construction and vacant buildings? To accommodate office needs of resurgent energy firms whenever resource shortages dictate drilling in the Overthrust Belt.

But when will the resurgence occur? Owing primarily to the inscrutable politics of OPEC, no one really knows. And, in an industry where secrecy about prospective well sites has been the norm, even those who have good theories are not telling. There is very little sharing of information and almost no collaborative planning in the energy industry.

For some energy professionals, such as uranium geologists, the handwriting is on the wall. It is evident that there will be virtually no new uranium mining in the United States for the duration of this century. Those who have specialized in this field can consider either moving their careers and families overseas or changing fields. But for geophysicists and most other earth scientists, career planning has become an exercise in guesswork and career management a conundrum. Should one make plans to change from a satisfying, stimulating, lucrative field when that field could return? Will there be a future in mining gold? In the meantime, how ought one try to earn a living? And what about investing time and money in additional education? The questions are puzzling, and often urgent.

Educators who attempt to help resolve questions such as these often find themselves functioning in a newly emerging role within the changing industry of higher education. The new role, which for lack of a better term might be called "learning facilitator," still is in the process of definition as concerned educators attempt to respond to adult learners' needs. The new role calls upon an amalgam of skills in personal counseling, labor market analysis, and academic advising. No single curriculum can prepare educators to function effectively as learning facilitators. Many of us find ourselves creating and refining resources as we work along.

The career counseling and academic advising materials that follow are described in the context of the two programs through which they have been developed. These two programs, it will be noted, are quite different in focus. Yet they are similar in intent--to help mid-career scientific and technical professionals move ahead with their lives--and their methods and materials are in many ways complementary.

Career Counseling

The University of Denver's Professional Career Development Program offers career services to individuals who are seeking new professional opportunities. Services include vocational interest assessment, resume preparation, individual consultation on career development methods such as correspondence and interviewing, and referrals to other professionals and employers in a variety of industries.

The University also offers a special program for companies wanting to evaluate their current and prospective needs for personnel. Called the Foresight System, this program evaluates current strengths and future needs within specific industries, enabling employers and employees to plan together to meet retraining needs required in America's evolving workplace.

In providing these services, ordinarily we begin with some questions that are basic to career management in any field, but especially to people with specialized skills such as scientists.

Scientific and technical specialists in mid-career can benefit from this kind of reflection: "Having been out of school X number of years now, in an evolving society in which my needs and interests also are changing:

- How has my field changed?
- How have labor market conditions changed?
- Which of my skills have become obsolescent?
- Which of my skills remain viable:
  - in practice?
  - or as a foundation for new learning?
- How has my motivation changed?
  - In which skills have I lost interest?
  - In which areas am I growing?"

Here are some ways to approach questions of market value.

Charting Employment Change

The following grid illustrates a method of segmenting several basic factors of employment, in order to discern some ways in which they may change. The verticle column describes five possible conditions of labor market demand: emergent, emerging, current, obsolescent, and obsolete.

(These categories were conceived by Clyde Helms of Occupational Forecasting Industries, Inc.)

The headings across the top of the grid (*industry*, *institution*, *position*, *task*, and *skill*) represent five components of an occupation. They begin with the broadest scope, industry, and end with the most specific, skill. (The categories are derived from the data system design of the management consulting firm, Price Waterhouse.)

	INDUSTRY	INSTITUTION	POSITION	TASK	SKILL
EMERGENT (foreseeable need)					
EMERGING (evident, growing need)					
CURRENT (strong, present need)					
OBSOLESCENT (declining need)					
OBSOLETE (no current or foreseeable need)					

The working life of any individual or organization may be influenced by change in any of the five top factors. Here are two examples:

INDUSTRY: Financial services
INSTITUTION: Bank
POSITION: Loan officer
TASK: Credit analysis
SKILL: Ability to understand a balance sheet

INDUSTRY: Health care
INSTITUTION: Hospital
POSITION: Marketing manager
TASK: Demographic analysis
SKILL: Ability to use SPSS software

Financial services and health care are fundamental functions in any society. However social conditions change, people continue to need these services and as industries they do not disappear. But the institutions through which basic services are delivered--such as banks and hospitals--do change. In recent years we have seen the rise of "bankless banking" with automated teller machines replacing some bank personnel. Other new institutions have emerged in health care: neighborhood treatment centers, wellness centers, the hospice. Institutions such as hospitals come and go.

Similarly, the positions through which people serve often change. Loan officers may find under conditions of deregulation that they are required to acquire new marketing and sales skills in order to develop new business for the bank. Changing market conditions may give rise to entirely new positions. A few years ago, who ever heard of a hospital marketing manager?

When we consider the tasks and skills that particular positions require, still other changes may become apparent. Credit analysis probably is perennial (as is the importance of being able to read a balance sheet), although it may increase in importance during times of economic downturn when more loans turn "sub-standard." Demographic analysis seems an increasingly important part of the growing field of marketing. And the ability to use SPSS software illustrates the importance of new technology, as well as the prospect that some other new software package may supplant this one.

Charting one's career can help identify marketable components. For example, a skill may be found highly marketable, even as the industry or position in which it was developed declines.

Here is another way to consider marketing skills.

Planning for Change

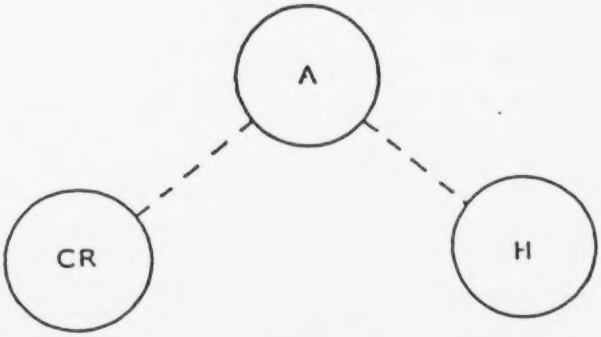
Career management, directing the course of our working lives, is a process similar to corporate strategic planning. Organizations which hope to stay abreast of new developments in a changing market regularly follow procedures such as these:

- Defining the business of the organization.
- Analyzing the external environment for opportunities and threats.
- Analyzing the organization's internal strengths and weaknesses.
- Developing the appropriate strategies.
- Designing the operational plan.
- Managing strategically.

(From Marina Buhler-Miko, A Trustee's Guide to Strategic Planning, Washington, DC: Higher Education Strategic Planning Institute.)

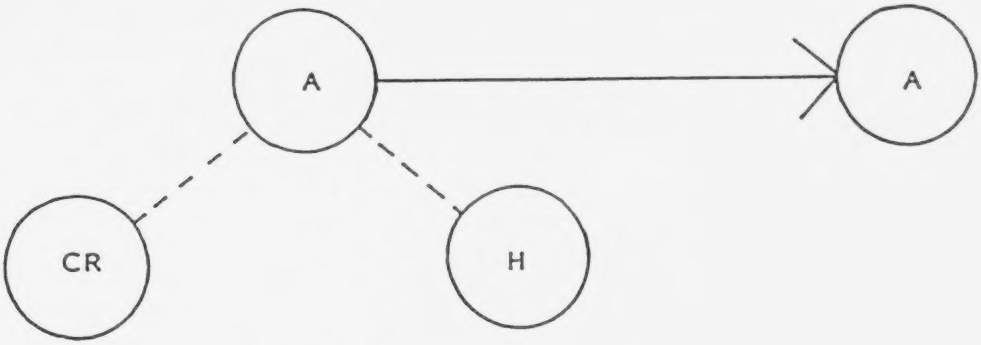
All of us who are interested in managing the progress of our careers should do the same, for each of these steps pertains to individuals. Here is an example of individual strategic career planning.

Consider an airline that owns two ancillary organizations in fields complementary to plane travel. One of the subsidiaries is a car rental company and the other a hotel chain. The airline and its subsidiaries can be represented this way:

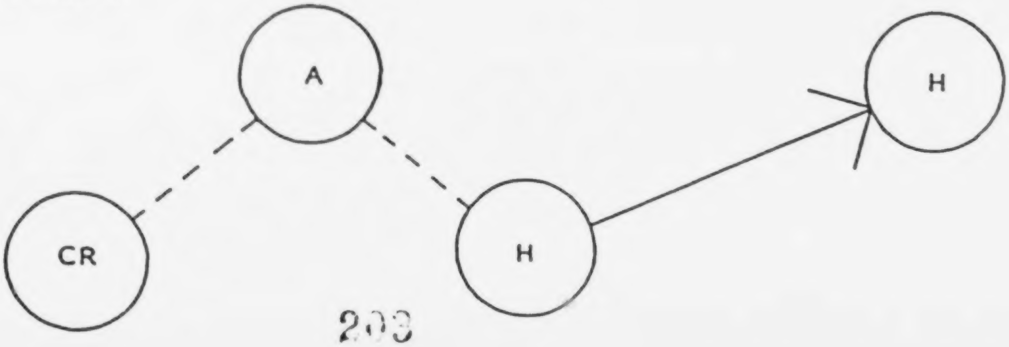


Suppose the airline's management decides to explore expanding its activity. Management addresses the task of defining the organization's business, and may arrive at two possible corporate identities with very different, corresponding courses of action.

If the organization views itself essentially as an airline in the business of flying, it may consider expansion by acquiring another airline. The transaction may involve subsidiaries of the two organizations, but the subsidiaries remain just that. The focus will remain on flying. This is Plan A:



However, the airline may consider an alternative way to expand. Perhaps it finds that the market for airplane travel is saturated, or that providing a single service entails unacceptable levels of risk. Management may then consider another way to expand, through one of its ancillaries. This is Plan B:



As individuals, we are apt to view career direction somewhat conventionally, along the lines of corporate strategic Plan A. We are most likely to seek a market niche that corresponds to our current job title, looking perhaps for larger responsibility or higher pay but holding to our present role with its ancillary skills. For many of us, that may be the best option.

But not always. Some of us, in analyzing opportunities and threats in the environment and strengths and weaknesses within ourselves, may decide upon a career course similar to Plan B. Here, we take stock of the component skills we have developed through our present job. Then, when we have described them fully and clearly (as in a resume), we may explore a career path in a subsidiary field.

Of course the two approaches are not necessarily mutually exclusive; Plan B may be pursued together with Plan A. Plan B may be somewhat demanding, involving careful investigation of job roles less familiar than the last one we've held. It also may require that we assume the role of a novice for a while. But for those whose present role has become tiresome and/or unmarketable, Plan B may be a vital alternative.

* * * * *

The resume on the following page is an example of a functional/ chronological resume format in which emphasis is given to those skills or capabilities that support a particular career direction. Richard, a uranium geologist, has summarized three groups of subsidiary skills, any one of which could form the basis for a Plan B diversification. In the event he chose to emphasize another of his skill areas (such as his background in data management, for example) his opening Summary of Qualifications would change.

Richard has chosen to develop some of his technical interests through some graduate courses in hydrogeology (a potentially more marketable specialty than uranium geology), and through working on his new home computer (an interest he'd never had time to explore in the midst of full-time employment). Perhaps some day the computer skills will contribute to a new position in data management; perhaps they will remain an enjoyable hobby. For the time being, he has found no ways to market his background in project management. That may be just as well, for he's happy growing through his analytical and technical skills.

RICHARD

Address - Phone

SUMMARY OF QUALIFICATIONS

Geologist with extensive experience in energy resource industry, and special interests in project and data management.

CAPABILITIES

Project Management - Experienced in full range of management functions including defining program objectives, budgeting, supervision of personnel, coordination of contractors, analyzing data, evaluating results, and communicating recommendations. Experienced in coordination with government regulatory agencies.

Fiscal Management - Includes budget development, cost analysis, and budget administration. Responsible for annual budgets exceeding one million dollars.

Data Management - As exploration geologist, was responsible for generating, organizing, and evaluating large quantities of field data from multiple sites.

EMPLOYMENT

Exploration Geologist - Uranium
Western Nuclear, Inc. (Subsidiary of Phelps Dodge)
Lakewood, Colorado, 1969-1984

Exploration Geologist - Petroleum
Shell Oil Company
New Orleans, Louisiana, 1966-1969

EDUCATION

MS - Geology, 1966
University of Wyoming, Laramie, Wyoming

BS - Geology, 1963
Florida State University, Tallahassee, Florida

PERSONAL

Married. Enjoy sailing, photography, outdoor activities, antique clock collecting, and home computing.

Paul is a 35-year-old geophysicist whose path is a bit more complex, illustrating some of the typical difficulties of rebuilding a technical career. He completed college as a physics major in the early 1970s, on a campus filled with unrest. His academic record was as unstable as the school. One semester he made straight A's, the next he spent in political organizing and almost flunked out. Later, while working in oil exploration, Paul finished a master's degree, and excelled in the program. He went on to specialize in the application of electrical methods to mineral exploration, and invented a new mathematical technique which helped make that process possible.

His success, however, was not to last. Gradually, Paul realized that he had entered the mineral exploration field during a boom period, when temorary shortages and speculation were spurring competitive and domestic exploration projects. When he lost his full-time job, Paul became an independent consultant; then the consulting dried up and he began to face the reality of unemployment. His highly specialized training in geophysical exploration and geology seemed non-transferable to other fields and he spent many months agonizing over polite rejection letters.

Ultimately Paul began working with a career counselor to establish a program of interviewing among physicists and computer specialists in fields outside geology, looking for a place where he could transfer and build on his existing skills. In talking with these colleagues, Paul was reminded of the unevenness of his education. In some areas, he was a recognized innovator; in others, as an undergraduate in the '70s, he was embarrassingly deficient.

Finally a job turned up with a research group in Albuquerque. The position carried much lower salary and status than any he'd had in the past ten years. On the face of it, the job was a demotion. In addition, the laboratory worked primarily on defense contracts; that didn't square with Paul's political values. But the job offered an opportunity to grow professionally in important ways. Paul could review some of the material he had failed to learn in college and branch out into the expanding field of atmospheric electromagnetic research at a time when geology continued to decline.

Paul has begun to identify specific learning objectives on the job, in both physics and computer science, through which he could become more marketable as a physicist. In addition, he is exploring a path that eventually could lead him back to geophysics--a field he still misses. An associate at the lab who specializes in constructing equipment has offered to help Paul build an electromagnetic receiver for a fraction of the retail cost. The receiver could be used for some independent exploration of mineral deposits, both as a pleasant weekend activity in the mountains with friends and as a possible future source of income should they find themselves in a position to stake their own claims. He also intends to explore geological applications of some of the new, computer-supported modeling techniques used by research physicists.

In a few years, as existing energy sources decline, Paul expects to see new opportunities for exploration geophysicists. With a knowledge of transferable techniques from atmospheric physics, and with his own electromagnetic receiver, Paul hopes one day to find himself working as an independent consultant, back on the frontiers of geophysics. He plans to continue regular interviews with a broad range of colleagues in geophysics, atmospheric physics, and computer science, and to update the skills summary paragraphs of his resume as a way of monitoring his progress. This is how that part of his resume appears today:

OBJECTIVE	To apply geophysical, geological, organizational, and computer abilities to energy exploration. Utilize data base systems to aid in analysis of geophysical, geological, and production information.
CAPABILITIES	Data Reduction and Reporting - Ran and interpreted resistivity, I.P., electromagnetic, ground and airborn magnetics, gravity and downhole logging surveys. Computer processing methods were developed to interpret results. Reports were written to summarize results, conclusions, and recommendations for \$200,000 to \$300,000 of project work per year. Graphics capabilities were established to aid in reporting. Data base system was used for geophysical and geochemical information storage and manipulation. Project Management - Planned and directed geophysical activities in the western U.S. and Alaska. Reviewed geologic objectives with project leaders and recommended geophysical programs. Budgeted for projects and hired contract personnel to perform geophysical surveys. Supervised contract personnel, monitored progress of contract agreements and program objectives. Research - Performed geophysical and geological research. Developed and extended computer methods for data analysis in the areas of electromagnetics, magnetics, induced polarization, and gravity. Computers - Utilized microcomputers for on-site data reduction and analysis. Experienced with PDP11 and IBM microcomputer operating systems as well as VAX and DEC mainframe computers. Fortran and graphics programming experience. Five years experience in data analysis, report writing, and project documentation. Developed graphics applications for map making and drafting.

The experiences of Richard and Paul represent two approaches to the management of technical careers: updating and revising skills within one's current field (as in Plan A in our corporate strategic planning analogy), or translating and transferring some part of one's skills into another discipline or profession (as in Plan B). For anyone with specialized skills, the process is challenging. Yet, as we have seen in the cases of these two earth scientists, mid-career renewal is possible. Scientifically and technically educated professionals generally have good learning abilities; most of them are capable of acquiring new skills which are both personally meaningful and viable in a changing marketplace. Good career counseling can assist them in this process. (For an elaboration of this approach to skills assessment, see Charland, 1986.)

So can effective academic advising. For those who may need to update specialized skills require accurate information on new developments in their disciplines and honest assistance in assessing their own educational interests and needs. Once again, we will describe methodology in the context of a particular academic program and the population it is intended to serve.

Academic Advising

The College of Sciences and College of Extended Studies at San Diego State University offer certificate programs to retrain adults who have been educated in the sciences and who need to upgrade their skills. In cooperation with local industry, for the past several years faculty of the Colleges have designed certificate programs in biotechnology, and chemical and physical analysis. The Assistant Dean for Student Affairs in the College of Sciences offers academic counseling to technical professionals in the San Diego area as they consider these courses in relation to mid-career decisions.

This process of academic advising (which is regularly extended to members of the San Diego scientific community at large) includes three phases: Career Assessment, Career and Academic Planning, and Institutional Curriculum Planning.

Career Assessment - Adults in mid-career are a diverse group with idiosyncratic interests, abilities, and needs. Thus the first step in assisting them is to listen carefully in dialogue. Most scientific and technical workers have specific questions about new subject matter, scientific applications, and technologies that have developed since their original training. For example, those who were trained in microbiology may need to know about the increasing integration of their discipline with chemistry, the application of knowledge in these fields to new endeavors such as the synthesis of biologically active molecules and their analysis in minute quantities, and new techniques in spectroscopy and instrumental analysis.

The advisor tries to provide accurate information about the job market in various career tracks including realistic forecasts of employment opportunities and salary expectations during the next decade. This information is melded with the evaluated strengths and interests of each individual including personal considerations such as geographical preference and financial needs. As a result of this dialogue, a set of relevant career options is identified.

One of the most critical resources for the counselor in this first phase of the advising process is accurate knowledge of labor market conditions. To be effective, advisors must have more than generalized, textbook knowledge of their local business and professional environment. Published materials may provide part of this information. The Office of the Assistant Dean at San Diego State, for example, maintains a directory of local employing firms that includes reports from staff visits to key organizations and a file of classified ads from the newspapers. Even more timely knowledge comes from the Assistant Dean's frequent attendance at professional meetings and ongoing conversations with fellow scientists whom she has known during the past decade.

San Diego presently is one of a half-dozen American communities vying to attract the emerging biotechnology industry which some feel could outperform even the computer industry in the economy of the future. "At stake is a virtually limitless potential for new and improved products, new processes for industry, and whole new industries, made possible by breakthroughs in the last decade in recombinant DNA, cell fusion, and novel bioprocessing techniques capable of producing entirely new organisms. This new biology, according to the [California] Office of Research, may, in fact, be the most significant technological revolution of this century when judged in terms of its potential impact." (San Diego Union, December 1, 1985.) (For a profile of one of the city's biotech competitors, see The Year Ahead by John Naisbitt, Chapter Six: "The San Antonio-Austin Corridor," 1984.)

The biotechnology industry has important predecessors in San Diego: the Scripps Clinic and Research Foundation, the Salk Institute, and a variety of other research centers. These institutions, together with substantial university research facilities, provide an infrastructure capable of supporting continuing growth in the field. In addition, the area's relatively low cost of living, pleasant climate, and favorable tax structure have induced biotechnology firms to locate in San Diego. One 300-acre area zoned for science-research outside La Jolla "now probably can claim as many scientists per acre as any non-university in the nation" (La Jolla Light, November 13, 1980).

Biotechnology promises vast numbers of new jobs ("The new industry has grown in less than 10 years from nothing to more than 200 firms and laboratories employing some 10,000 persons." San Diego Union, op. cit.). But many of these new jobs require far more extensive education in physics and chemistry than biologists traditionally have received, together with training in the instrumentation of the "new biology."

Biologists who seek to update their technical skills may be motivated by more than the excitement and promise of a new field. They also may feel the pinch of necessity. For the same advances in instrumentation that support new biological research have replaced many of the labor-intensive testing procedures employed in the health care industry. At a time when hospitals are struggling to contain costs, the new biology has threatened the jobs of traditionally trained medical technologists.

Effective academic advising in the sciences requires the advisor's active involvement in a constantly changing professional environment, and close attention to the impact of these changes on labor market conditions.

Academic Planning - Academic advising also involves helping the individual to design a meaningful educational program using existing course offerings, keeping many options open in the early part of the plan and fine-tuning the sequence of courses toward a specific focus as the career goals become better defined.

A number of related services build on the previous career assessment: encouraging attendance at seminars, professional meetings, and other informal opportunities for networking; making available current job descriptions within the individual's new career options as they appear in scientific journals, bulletins, and newspaper advertisements; and sometimes providing referrals to the University's Counseling Center for assistance in other areas such as personal counseling, assertiveness training, confidence-building, time management, or study skills.

Institutional Curriculum Planning - Good academic advising with mid-career professionals provides useful data for curriculum enhancement. In working closely with employees and their organizations, advisors constantly encounter the educational agenda of their communities. Which skills are becoming obsolescent; which are emerging? Knowledge of the employment market can help shape courses which provide education for viable skills, thus augmenting the traditional foundation courses of each discipline.

The actual availability of courses that mid-career students need may be problematic. In general, the postsecondary educational institutions most accessible to adults (in cost, location, and class schedule) are two-year community colleges and corporate-sponsored inhouse training programs. Often, individuals who need to build on highly specialized skills will not find the resources they need in either of these institutions. The community colleges are unlikely to have faculty, library, and laboratory resources equal to the task. And corporate-sponsored training ordinarily focuses on job-specific instruction to the exclusion of education in pure mathematics or science. (Exceptions may be found among the two dozen four-year colleges now sponsored by corporations, half of which now are regionally accredited and a few of which have developed doctoral programs.)

Paradoxically, the schools that are best equipped to educate mid-career scientific and technical specialists often are least accessible to these individuals. For most established universities are structured primarily for the education of full-time, resident students and their class schedules serve those who can afford to study with professors who prefer to teach during the day. (One of the principal outcomes of the certificate programs at San Diego State has been a sharp increase in the number of upper division, career-related courses in chemistry and molecular biology offered at night.)

All these elements of academic advising enable a university to improve options in high technology employment for the mid-career scientist. As in the case of two women in science:

Alice is a licensed medical technologist who received her bachelor's degree from a major Midwestern university 24 years ago. Immediately after graduation, she began work in the hospital where she served her clinical internship. Alice continued to learn new clinical techniques over the years and developed a successful career. For the past ten years she has directed the laboratory of a small, non-teaching hospital in the San Diego area. The work was challenging and rewarding, but Alice began to doubt its future.

Recent changes in regulations for clinical tests that are reimbursed by diagnostic-related groups (DRGs) had begun to make hospital laboratories cost- rather than revenue-generating. Continuing automation of diagnostic procedures reduced personnel requirements. At the same time, hospital occupancy was in decline. As the highest paid employee in her unit, Alice felt vulnerable should there be a layoff. She knew that her skills in clinical procedures and laboratory management did not include a strong background in advanced chemistry and the new field of molecular biology. That deficit hindered her prospects for retraining. At the same time, she could not afford to give up her job and return to school during the daytime. And, indeed, she had no idea what to study even if she could do so. Alice began looking for counsel and found the program at San Diego State University.

During an initial career assessment, Alice's academic advisor helped her to research employment opportunities in San Diego's growing biotechnology industry. They reviewed a number of job notices from 20 local companies and identified some critical skills required by the positions.

Then they identified a series of evening courses--in analytical chemistry, biochemistry, recombinant DNA--related to those skills. Alice is completing the courses today, as she continues her employment. Conditions at the hospital are no more certain, but Alice feels a new sense of confidence in her career as she looks forward to combining her laboratory and administrative experience with a good foundation in sciences which are basic to an emerging field.

* * * * *

At age 28, Marilyn found herself with a strong academic background which had proved unmarketable. She had received M.S. and Ph.D. degrees from a major university in the Southwest and had worked for a few years carrying out assessment and compilation of fishery data. When a teaching position opened at a local college, she opted for an academic career and got the job. Marilyn spent several years teaching lower division courses in the natural sciences and enjoyed her work. But due to demographic changes the college's enrollment began to decline. And when Marilyn came up for tenure, there turned out to be fewer positions than junior faculty members; her application for tenure was denied.

During the years Marilyn had trained in graduate school and then taught at the college, revolutionary advances occurred in two areas outside her studies: molecular biology and biochemistry. Discoveries in recombinant DNA and other techniques had given rise to a wave of new industrial firms where this emerging technology could be applied to the development of products in the health care and pharmaceutical markets. Marilyn was well aware of these new developments but untrained in the skills they required. She found herself well-educated as a classical biologist but unemployable in a growing market for molecular biology.

Participating in a program for women in science, Marilyn met with an advisor who helped her assess her skills. They recognized that Marilyn had an excellent background in scientific methodology and classical biology, as well as specialized knowledge of marine biology. In addition, through her teaching experience she had developed excellent written and oral communication skills. But both higher education and marine biology were declining fields.

Marilyn enrolled in an updating series of review modules in mathematics and chemistry and some courses in the "new biology"at San Diego State. She supported herself by utilizing her communications skills in real estate property management and sales.

During her second year in the program, Marilyn began to apply for a series of academic positions related to her new training: as a geneticist, molecular biologist, microbiologist, and medical researcher. Midst keen competition, she was unsuccessful in each case. The only way forward in microbiology seemed to be as a rank novice: serving for several years in a series of low-paying postdoctoral positions while trying to establish herself by winning grants and publishing in the new field.

It became clear that Marilyn's retraining was going nowhere. Never strong in chemistry and the physical sciences, she was losing her motivation to continue trying to grow in these areas. Her efforts in real estate, on the other hand, were quite successful even though unsatisfying. With the help of her advisor, she began to consider whether the real estate work might in fact represent some latent, unrecognized strengths in organization and communication. Perhaps these skills could be tied to another kind of technical career.

They enlisted the help of a career consultant who represented some local technical firms in executive search. One of his clients, an engineering company, was seeking a manager for a new quality control department. The career consultant helped Marilyn identify and communicate her skills which could relate to the new position: an ability to comprehend technical material, knowledge of how to interpret federal regulations, a capacity to organize and evaluate data, and strong communication and interpersonal skills. Marilyn today earns a high salary and supervises a staff of 20, as director of quality assurance for the engineering firm.

Marilyn's long, tortuous program of retraining illustrates the degree of effort that the renewal of scientific careers frequently requires; it is never easy to learn and work on an intellectual frontier. But her experience also shows some of the same qualities we have seen in other cases; scientists are bright, disciplined people well-accustomed to the challenge of trial and error. They know how to learn.

The two helping services which we have explored--career counseling and academic advising--often are as interrelated as Marilyn's case suggests. Career and academic advisors who can utilize some of the resources we have seen will be able to assist many scientists who struggle in the midst of change. And in the process they and their institutions will benefit as well. For all of us are affected by social change. And all of us can learn and grow.

* * * * *

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FOR YOUR INFORMATION

News and announcements for those involved in education for a changing economy: an information service of the Resource Agent Project, the National Institute for Work and Learning, 1302 18th St., N.W., Washington, D.C. 20036 (202) 887-6800

This issue of **For Your Information** marks the inauguration (particularly appropriate this month) of the newsletter's sponsorship by the Fund for the Improvement of Postsecondary Education (FIPSE) through a two-year grant to the Institute. Under the grant, NIWL is serving as a resource agent for policies and practices in the area of postsecondary education for a changing economy. This project is one of 22 FIPSE projects which are members of the "Education and the Economy Cluster," an organizational concept launched by FIPSE in the Fall of 1983. The cluster notion evolved out of FIPSE's history of supporting new curricula and educational approaches for adults in a variety of settings. Against a backdrop of major demographic and economic shifts, a general uncertainty persists regarding where future jobs will be and what skills they will require. Concern about technological change, (re)training, new partnerships, international economic competition, and movement toward a service and information economy has resulted in "an interesting profile of FIPSE responses" (to quote FIPSE sources).

While the problems addressed and the solutions developed by each of the 22 cluster projects differ, there are a number of common themes that run across these efforts. First, each of the projects is responding to a problem or set of problems that is the result of changing economic or demographic realities.

Second, the population being served by these projects is adults, most of whom are or have been in the workforce. For many of the postsecondary institutions involved, this is the first time they are dealing with a population of learners who are mature, experienced, and looking for educational programs that are responsive to their needs for training, jobs, or self improvement.

Third, most of these projects are generally on the fringe of postsecondary education programs; that is, they are usually housed in offices that are not part of the main educational units within the institution and operate on "soft" monies.

Finally, the projects are mainly concerned with empowering people and/or organizations. Most of the projects focus on providing the skills and services necessary for career and life planning on the part of the individual and for human resource planning by organizations. These skills range from basic literacy and advanced scientific training on one level and education/career development and human resource development on another level.

While all 22 projects in the Education and the Economy Cluster share the common features just noted, certain projects within the Cluster share even more common concerns and approaches. Specifically, each project fits into one of three sub-clusters: 1) Partnerships for Economic and Community Development; 2) Partnerships for Basic Skills and Literacy; or 3) Partnerships for Professional Skills and Development.

The purpose of the sub-clusters, like that of the Cluster, is to strengthen communications and support among projects working in each of these areas. Experience to date has shown that, through this networking process, project operators have learned much from one another and have gained different perspectives and applications of their programs. They have also learned how to anticipate and work more effectively at different stages of their projects and have appreciated the added significance of their projects being part of a larger, national effort.

Starting with the current issue, each edition of **For Your Information** will highlight several of the projects that are members of the Education and the Economy Cluster, as well as report on other projects that are involved in education for a changing economy. We invite all our readers to share any information you may have on projects and resources relating to this area, so that we may keep you informed and up-to-date on the latest developments through our "Project Profiles" feature.

PROJECT PROFILES

In this issue we describe three projects that have recently "graduated" from FIPSE's Education and the Economy Cluster — that is, they are no longer receiving financial support from FIPSE but remain "members emeriti" of the Cluster. Descriptions are also provided for the innovative education and training programs negotiated by the United Auto Workers (UAW) with the Ford Motor Company and General Motors Corporation.

Rio Salado (AZ) Community College's Intensive In-Plant Technician Training Model

This cluster project was developed in response to local industry's need for trained microprocessing technicians. The College initiated a one-year Associate degree program, which includes technical and general skill development, delivered at the workplace by industry-based faculty. The curriculum was developed jointly by the College and the company, Motorola, Inc., and was designed mainly for women and minority assembly line workers in the company.

This one-year Associate of Science degree program is competency-based with courses offered in the following: electronics; A.C. and D.C. theory; circuits; instrumentation; math; English; and solid state devices. Support services and counseling are provided to all participants, as well as courses in math anxiety, self-awareness, coping strategies, and team building to help overcome participants' fears and ease them into the education/training experience.

By offering the program at the worksite, many employees are able to participate who might not have been able to otherwise, and by offering it as part of a college program, these workers obtain a degree as well as a set of specific job related skills and competencies.

To date, 98 percent of the participants have completed the program and 95 percent of these have been promoted from the assembly line to a professional level, with an average raise in salary from $8.25 to $10.00 per hour.

For more information, contact: Andy Bernal, Rio Salado Community College, 135 North Second Avenue, Phoenix, AZ 85003, (602) 256-7722.

The Industrial Consortia Project of the New Hampshire Continuing Education Network

Another "graduate" of FIPSE's Education and the Economy Cluster, this project had two major goals: to increase educational opportunities for adults throughout New Hampshire and to assist institutions in responding both cooperatively and individually to the needs of outside organizations or groups as well as the individual adult learner.

The Network sought not only to expand credit and non-credit offerings on campus, but also to expand programs at off-campus sites. Its efforts also included the development of industrial consortia across the state to expand training opportunities for business and industry. One of the major functions of the Network staff was to assist institutions in seeking out organizations, companies, and groups of individuals with specific educational needs and to assist in the delivery of courses/programs to meet these needs through one or more Network institutions.

Twenty-two colleges joined together to offer education and training programs to workers at the workplace. A request for proposal (RFP) process was used to provide information on the courses and programs being offered and for the selection of the provider of services.

The Industrial Consortia Project involved businesses and industry in the active planning, decision making, and coordination of education programs in the state. Initially much of the education/training requested by the businesses was at the basic skills level. As more organizations joined together to obtain training for their employees, the range of courses and programs became more complex. Over 700 students enrolled in courses ranging from basic skills to management training in the two years of the project. Businesses and employers were very satisfied with the responses of the education/training institutions.

For more information contact: Eric Brown, New Hampshire College and University Council, 2321 Elm Street, Manchester, NH 03104, (603) 664-3432.

Project TECPLAY, Charleston, South Carolina

This project, operated by the National Institute for Work and Learning and the Charleston (SC) Higher Education Consortium with funding from FIPSE, was designed to improve access to and use of skill and career development resources by minority disadvantaged youth from Charleston's East Side neighborhood.

The essential features of Project TECPLAY are: (1) the operation of a neighborhood-based learning center staffed by qualified counselors and facilitators and providing a mix of computer-assisted learning (including computer learning games) and career planning; (2) the involvement of employers in a wide range of activities supporting the center's career development program; and (3) the involvement of community social services and neighborhood leadership to sustain participation.

The project began in July 1982, with a local "Fair Break Center" equipped, staffed, and operating by late September 1982. The Center operates a program of basic skills, G.E.D. preparation, and career development experiences for groups of approximately 45 young adult participants. During 1983-84, the Center enrolled 156 participants, 98 percent black, two-thirds female, over 85 percent between the ages 17-30. The Center's environment, which combines "high-touch," personalized staffing with "high-tech" computer-assisted, self-paced instruction and learning games, has proven to be highly attractive to program participants.

For more information contact: Gerard G. Gold, National Institute for Work and Learning, 1302 18th Street, N.W., Suite 501, Washington, D.C. 20036, (202) 887-6800, or Ann Baker, Charleston Higher Education Consortium, 171 Ashley Avenue, Charleston, SC 29425, (803) 792-3627.

The United Auto Workers-General Motors Skill Development and Training Program

A revolution in American industrial relations was signaled by the historic 1984 agreement between the United Auto Workers (UAW) and General Motors (GM) Corporation. This three-year contract attempts to change the core pattern of labor-management relations by emphasizing the joint responsibility of employer and employee for the productivity, profitability, and overall health of the organization and for the job security, skills, and career development of the individual. The UAW-GM contract set a pattern soon followed in the UAW-Ford agreement. Employers and unions nationwide are studying the contract for lessons fitting other situations.

The predecessor of the new contract was a 1982 agreement that established the UAW-GM Joint Skill Development and Training Fund, also known as "the nickel fund" because it is financed by a GM contribution of five cents per hour worked by a UAW member. During 1983 and 1984, this joint fund was the basis for establishing five Placement and Training (PAT) Centers in communities with substantial numbers of laid-off UAW-GM employees. The core mission of these centers was to provide assessment, education, training, and placement services for displaced UAW-GM workers. A second mission was to assist active UAW-GM employees whose skills and job classifications were identified as becoming obsolete. The Centers were designed to be administered by joint UAW-GM directors while contracting as needed with area community organizations for specific services.

The new contract significantly expands the role and services of the Joint Skill Development and Training Program. At the same time it requires each local union and plant to establish a Joint Skill Development and Training Committee. In addition to the continued "nickel fund," a new ten cents per hour contribution creates a "dime fund" whose use is targeted for support of local training activities. The dime fund can be used in coordination with the plant manager's traditional in-house training funds but is subject to agreement by both the local Joint Committee and the national Skill Development and Training Program. The details of these relationships will be tested during 1985.

The key program components of the UAW-GM agreement are three:

1) Tuition Assistance Program (TAP): This is actually two programs, one for laid off (inactive) workers with a maximum "account" of $5,000, and one for active workers with a ceiling of $1,500 annually. Pre-payment of TAP funds was negotiated for both groups to encourage participation by tight-budget members.

2) Paid Educational Leave (PEL): This highly innovative component enables local Joint Committees to select eligible workers who want to pursue full time educational programs not limited to vocational training, labor studies, and college degree programs. UAW-GM employees can use PEL to learn new skills needed, for example, to serve more effectively on Joint Committees, to participate more actively in civic affairs, to study new technologies, or to set up in-plant education and training programs.

3) JOBS Program: Also highly innovative, JOBS enables GM and the UAW to jointly manage the employee retraining and placement process without placing the employee on lay-off. This process uses vocational counseling, personal ability and career assessments, and employee training to make job matching determinations within the GM structure or among external career opportunities. Task analysis is applied to GM jobs and specified external jobs. Skill and interest analyses are linked to task analysis and job availability. Both TAP and PEL can easily be integrated into the JOBS process.

For more information, write: UAW-GM Skill Development and Training Program, Fisher Building, Suite 326, Detroit, MI 48202.

The United Auto Workers-Ford Motor Company Employe Development and Training Program

A key feature of the 1982 UAW-Ford Collective Bargaining Agreement was the establishment of the Employe Development and Training Program (EDTP), designed to "promote training, retraining and development activities and efforts." The EDTP established a UAW-Ford National Development and Training Center with a small professional staff that works with joint local EDTP committees to design and implement local programs. The local committee is key - no project can be initiated without local impetus. Committee members, comprised of UAW and Ford representatives, determine the needs of their particular area. Working with the National Center, the local committee designs and implements its plan.

In addition to the local programs (that can be funded at any Ford plant site), there is a series of regional Career Services/Reemployment Assistance Centers. The Centers are designed to be one-stop displaced employee assistance locations, with access to such services as vocational and educational counseling, selected retraining programs, referral to community services, prepaid tuition assistance, and job search skills training. Regional Centers have been established in California, Alabama, Michigan, and Indiana and have served over 4,500 displaced employees.

Funding for all these activities comes from the "nickel fund" - a five cent setaside for each hour worked by UAW employees. In some areas, this money has been used to leverage funds from the Job Training Partnership Act (JTPA), making it possible to expand and enhance the services to laid-off workers in certain locations.

A unique feature of the UAW-Ford Employe Development and Training Program is that it provides for a variety of services to both active and laid-off employees. UAW workers currently on the "active employment" roll have available to them the following options: (1) the Education and Training Assistance Plan, which includes prepaid tuition and fees for most formal education courses as well as for certain "personal development" education and training opportunities, such as communications skills training and computer literacy; (2) Career and Educational Counseling and Guidance; (3) Basic Skills Education; (4) Special Associate Degree, a program offering college-level business and technical education courses; (5) Pre-Retirement Counseling; and (6) Targeted Education, Training, or Counseling Projects that cover specific education/training needs of a particular location or segment of the workforce.

UAW workers who have been laid off by Ford may benefit from a variety of approaches: (1) the National Vocational Retraining Assistance Plan which provides prepaid tuition assistance for self-selected education and training; (2) Targeted Retraining Vocational Projects, offering technical skills training in areas with job opportunities; (3) Vocational Plan and Interest Surveys, aimed at collecting information on workers' career plans and interests to help local EDTP committees in developing local activities; (4) Career Counseling and Guidance; (5) Job Search Skills Training; (6) Career Day Conferences; (7) Skill Enhancement, to help improve or brush up on basic skills or prepare for G.E.D. tests; and (8) Relocation Assistance in the form of loans or grants when transferring to new job opportunities more than 50 miles from the former work location. Over 24,000 laid-off employees had participated in these programs as of July 1, 1984.

For more information, write: UAW-Ford National Development and Training Center, P.O. Box 6002, Dearborn, Michigan 48121.

RESOURCES

Adult Learners: Key to the Nation's Future

In this report, the Commission on Higher Education and the Adult Learner outlines the need for a new emphasis on adult learning and suggests specific programs to meet this need. The paper argues that the United States is in an increasingly competitive economic struggle, at a time when there are fewer new workers each year and when technology is rapidly changing every facet of the economy. According to the Commission, our major resource is human capital; this poses a new challenge to the nation's providers of education and training for adults.

The Commission urges specific actions by the federal government and by the major participants in providing education and training to adults, actions directed at: developing or renewing employability for the unemployed; maintaining and enhancing occupational skills in the face of technological change; eliminating adult illiteracy; providing equal access to education for all adults; and developing knowledgeable citizens in an information-technological society. For more information, write: The Commission on Higher Education and the Adult Learner, 10598 Marble Faun Court, Columbia, MD 21044.

Adults and the Changing Workplace

This compilation, published by the American Vocational Association, contains 31 chapters, authored by 35 experts, addressing changes in the workplace and how these changes will affect adult vocational education. Among the contributors are Robert Worthington, Morgan Lewis, Alan Knox, Carol Aslanian, Patrick Penland, Paul Barton, and Robert Craig. Chapters include an analysis of the changes occurring in the U.S. workforce, an examination of the adult education universe, an appraisal of groups with special interest in the adult learner population, and examples of how to put adult educational theory into practice. Contact: American Vocational Association, 2020 N. 14th Street, Arlington, VA 22201.

America at Work: The Management Perspective on Training for Business

This survey of more than 300 senior human resource executives at Fortune 1500 firms was conducted in order to gain "clearer insight into their perspectives toward retraining workers and educational alternatives." One of the major findings is that businesses are not opposed to retraining workers whose skills have become obsolete but are unsure how to go about retraining their employees. As a result, most employers now replace workers rather than retrain them. The report goes on to say, however, that a shrinking workforce may make worker retraining a more attractive long-term solution. For the 68 percent of the respondents who use outside vendors for training, the outside sources used most often are public and private vocational schools and two-year colleges, with the two-year colleges most likely (and universities least likely) to provide customized training programs to specific firms. Contact: ITT Educational Services, Inc., 1600 M Street, N.W., Washington, D.C. 20036, (202) 296-6000, Att: Carol Cataldo.

Bridging the Gap: A Learner's Guide to Transferable Skills by Paul Breen & Urban Whitaker

Developed with assistance from the W.K. Kellogg Foundation, this workbook (and its companion interactive software program) details a series of tasks, with accompanying exercises, aimed at identifying career-transferable skills. The tasks include "Clarifying Your Values," "Skills Assessment," "Developing Your Individualized Learning Plan," and "Evaluation: Monitoring Changes in Values, Skills, & Learning Needs." Contact: The Learning Center, P.O. Box 27616, San Francisco, California 94127, (415) 334-3196.

Earn College Credit for What You Know by Susan Simosko

Written under the auspices of the Council for the Advancement of Experiential Learning, this handbook is a guide for putting together a "portfolio assessment", documenting outside knowledge gained through jobs, community service, hobbies, independent reading, and special interests and accomplishments. In addition to chapters dealing with how to gather the appropriate background information, how to document it, and how to assemble it, there is a list (with names and addresses) of 571 U.S. colleges and universities which have prior learning assessment programs. Contact: Acropolis Books Ltd., 2400 17th Street, N.W., Washington, D.C. 20009 or call toll-free 800-621-5199.

JOBTRAIN, New Quarterly from CTB/McGraw-Hill

A new quarterly publication, JOBTRAIN, is being published by CTB/McGraw-Hill to provide information and technical assistance to people who are involved in planning and implementing assessment, training, and placement programs for the unemployed. This publication features articles, interviews, and reports on Job Training Partnership Act programs as well as nongovernmental programs and local projects that relate to "retraining the workforce." For a free subscription, write: JOBTRAIN, McGraw-Hill, Inc., 2500 Garden Road, Monterey, CA 93940.

The Ladder Available by Subscription

The Ladder is a bi-monthly newsletter published by Push Literacy Action Now (PLAN), a nonprofit, community-based adult literacy program. The newsletter provides "the latest thinking on literacy issues, teaching techniques and politics." Recent newsletters have included articles about Congressional action on adult education, California's literacy campaign, the Educational Testing Service's upcoming report on young adult literacy, and the National Coalition for Literacy's advertising campaign. Contact: The Ladder, c/o PLAN, Inc. 2311 18th Street, N.W., Washington, D.C. 20009.

The Learning Enterprise: Adult Learning, Human Capital, and Economic Development by Lewis J. Perelman

A publication of the Council of State Planning Agencies, this report argues that an adult learning crisis will put the U.S. economy "at risk" between now and the beginning of the next century. The author maintains that defusing a crisis of obsolescent human capital in the postindustrial age requires a new kind of learning enterprise — focused on adults rather than children, on the process and technology of learning rather than educational institutions, and on private competition rather than public administration. In Perelman's view, adult learning in the postindustrial economy will no longer be a recreational or remedial activity but will become an essential industry in the increasingly critical "knowledge sector." Contact: The Council of State Planning Agencies, 400 North Capitol Street, Suite 291, Washington, D.C. 20001, (202) 624-5386.

CONFERENCES

"The Undergraduate Experience: From Training Courses to Taking Charge"
National Conference on Higher Education,
March 17-20, 1985,
Chicago, Illinois

Sponsored by the American Association for Higher Education, the 1985 National Conference, with over 200 presenters, will address the issue that high technology, global interdependence, longer life spans, the video culture and other changes "all seem to lead to a need for a 'common higher learning' that gives individuals the capacity to take charge - first of their own lives, then of our collective future." The Conference will focus on four specific subtopics: Changing Tasks; Powerful Encounters: Curriculum and Teaching; Powerful Encounters: Campus Life; and Getting from Here to There. FIPSE's Education and the Economy and Computer Clusters will be presenting as part of the program. For more information, contact: American Association for Higher Education, One Dupont Circle, Suite 600, Washington, D.C. 20036, (202) 293-6440.

Commission on Higher Education and The Adult Learner Regional Conferences, Spring 1985

For general information, contact: The Commission on Higher Education, and the Adult Learner, 10598 Marble Faun Court, Columbia, MD 21044, (301) 997-3535.

In 1985, the Commission is continuing to cosponsor a series of regional conferences to further its purpose of addressing developments in public policy and in college and university operations that would be more responsive to adults than existing policy and practices.

1) Governor's Conference on the Adult Learner
February - March 1985
Jackson, Mississippi
Contact: Dr. Eugene Tinnon, Dean of Continuing Education and Public Service, University of Southern Mississippi, Box 55, Hattiesburg, MS 39401, (601) 266-4186.

2) Teleconference: to interest faculty in using new ways to reach and teach adult students
Early Spring 1985
Contact: Dr. Elizabeth Menson, 133 Honor Court, Lancaster, OH 43130, (614) 653-0692.

3) **Building the Foundations for the Business and Education Partnership**
March 6-8, 1985
Kansas City, Missouri
Contact: Dr. Russell Wilson, Vice President, Kansas City Regional Council for Higher Education, 912 East 63rd Street, Kansas City, MO 64110, (816) 361-4143.

"HRD Means Business"
The 1985 American Society for Training & Development Conference & Exposition
May 19-24, 1985
Anaheim, California

This conference, designed for the "human resource development professional," will offer more than 300 concurrent sessions devoted to career development, international training, organization development, and other areas as well as special programs dealing with national HRD issues and research. These include: technology; training and retraining the workforce; management; quality of work life; and computer-based learning. For more information, write: American Society for Training & Development, 600 Maryland Avenue, S.W., Suite 305, Washington, D.C. 20024.

VIEWPOINT

We invite you, the reader, to share your thoughts and concerns on subjects relating to "education and the economy" by using VIEWPOINT as a public forum for your comments. Please send your (brief) Viewpoint to us for possible inclusion in future issues.

Recently there has been a spate of reports focusing on the mainly sorry state of education in this country. Most of these reports, including the well-publicized results of the National Commission on Excellence in Education and the more recent findings of the National Endowment for the Humanities' Study Group on the State of Learning in the Humanities, address only the education of the traditional, youthful student population. Little, if any, attention is paid in these studies to the educational needs of adults, despite the growing realization that the education and training of adults are critical not only to the individual learner but also to the economic, political, and social well-being of our society as a whole.

We agree with the findings of the Commission on Higher Education and the Adult Learner, as stated in its position paper, Adult Learners: Key to the Nation's Future, that "the fostering of learning by adults is an immediate and compelling national need, a need requiring a lucid and forthright statement of national policy and immediate attention by the nation's colleges and universities." For our educational system to be responsive to the needs of adults, particularly those affected by our rapidly changing economy, education institutions must look beyond their traditional role of educating youth to their emerging role in adult education and training. Education must be responsive to the diverse demands of our diverse society.

While paying heed to the call for excellence in education for the young, education and training institutions must make "the accommodation necessary to serve adult learners with full and equal effectiveness."

The Resource Agent Project is supported by the Fund for the Improvement of Postsecondary Education.

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THE EAR

Education and the Economy Alliance Report

Information for those involved in education for a changing economy. A service of the Resource Agent Project, the National Institute for Work and Learning.

August 1985

PROJECT PROFILES

This issue highlights three current projects in FIPSE's Education and the Economy Alliance, as well as the Minnesota Job Skills Partnership Program.

The Employment Transition Program, Ann Arbor, Michigan

Developed by the Institute of Science and Technology at The University of Michigan, the Employment Transition Program, funded by FIPSE, seeks to help displaced blue collar workers, mainly from the auto industry, become reemployed and to increase these workers' participation in retraining programs.

The most unusual feature of this program is its emphasis on the external labor market and the prospects for the future. Program participants confront directly the problems of the labor market faced by career changers and develop skills that enable them to evaluate training programs and jobs, find them, and get them.

The program, which has served more than 1,000 individuals, includes joint planning with management and union representatives and the delivery of a 30-40 hour career change program to groups of 20 people, with two co-trainers using a study circle process. The programs are all offered in community settings, usually union locals, church basements, and other informal locations.

The study circle approach offers individual participants a high level of support and group interaction, combined with important skills building and information delivery. Participants undergo a self-assessment process which includes psychological, financial, educational, and work history factors, as well as an environmental assessment which covers occupations, skills, methods of determining areas of potential career development, and labor market information on available jobs.

Participants then perform a "cost-benefit" analysis of their options, based on their assessments, which helps them make career decisions and develop plans to carry out those decisions.

Results to date show that program participants are more likely (by 50%) to become reemployed in a new occupation than non-participants and are much more likely (100%) to enroll in retraining than non-participants. Further, the retraining they select is longer (two years rather than nine months), more expensive ($4,000 + rather than $2,000), and more targeted to growth areas.

For more information contact: Jeanne Prial Gordus, The Institute of Science and Technology, the University of Michigan, Ann Arbor, MI 48109, (313) 763-3645.

The Experienced Workers Re-Training Program, St. Louis, Missouri

Major changes in the St. Louis area economy have displaced tens of thousands of workers, most with excellent work histories and good skills. Through the three-year Experienced Workers Re-Training Program, St. Louis Community College is providing educational upgrading and intensive vocational/occupational training to 250 workers who wish to make a career change from unskilled/semi-skilled production occupations to high demand service and technical jobs.

Building on the College's Metropolitan Re-Employment Project, a privately funded counseling, job preparation and referral project for laid-off workers, the Program, supported by FIPSE, offers workers intensified occupational/vocational skill development programs sush as the Business Services with Computer Applications Program and the Electronics Program. In addition, all participants receive 20 hours of support classes in job interviewing skills, resume writing, financial planning, and communication skills. Spouses are encouraged to participate in these self-awareness/improvement courses.

The Program also provides supportive counseling services for workers during their re-training. This is proving to be a very important feature as attending classes and beginning a re-training program can be a new and often traumatic experience for the older unemployed worker.

Program staff are also conducting an ongoing analysis of occupations currently in demand and those with good growth opportunities. The College's partnerships with the St. Louis Private Industry Council and the St. Louis Regional Commerce and Growth Association are central to the analysis and overall impact of the Program.

For more information contact: Michael Maguire, St. Louis Community College—Forest Park, 5600 Oakland, St. Louis, MO 63110, (314) 644-9142.

Educational Bridges to Options in High Technology Employment Project of San Diego State University

This unique FIPSE project offers retraining and updating in biotechnology and analytical chemistry to about 100 mid-career adults who have a baccalaureate or higher degree in a scientific discipline and who completed their formal education over five years ago. This group includes some chemistry, biology, and mathematics high school instructors who are offering advanced placement courses at their institutions.

The program makes it possible for already-working individuals to expand and improve their knowledge to the state-of-the-art and fosters professional development and career enhancement. Furthermore, these educational opportunities enable workers presently employed in positions that are becoming obsolete as a result of technological or economic changes to have wider options in seeking new jobs.

The retraining tracks were selected in the fields of analytical chemistry, biotechnology and microelectronics to correspond with the greatest number of employment opportunities that exist locally. The educational offerings are grouped into three categories:

- "A" courses: Especially designed intensive review courses for students who have previously had a formal course in the subject.

- "B" courses: Courses from the regular curriculum in mathematics, computer science, chemistry, physics and biology, offered in the evening.

- "C" courses: Courses offered in a nontraditional time frame and/or divided into modules.

Students may elect to take one or a series of modules, according to their individual retraining needs. By taking a prescribed sequence of offerings from the categories described above, participants may earn a Certificate in Modern Analytical Chemistry or Recombinant DNA Technology. These high level Certificate programs will serve as models for the design of similar programs in other scientific disciplines.

The individuals participating in this project will be upwardly mobile at their present place of employment and, when seeking new employment, will be more competitive in today's high technology job market. University professors and administrators, through dialogue with their industrial colleagues at the project's Advisory Board meetings, are becoming more responsive to the educational needs of the indistrial sector of the community. It is hoped that the growing scientific industry in San Diego will turn to the University for the design and delivery of its educational and retraining needs as the partnership develops and flourishes.

For more information contact: Dr. Celia Marshak, College of Sciences, Room LS-133, San Diego State University, San Diego, CA 92182, (619) 265-5350.

Minnesota Job Skills Partnership

The goals of the Minnesota Job Skills Partnership, are to: provide growing Minnesota businesses with appropriately skilled labor; enhance the capacity of schools to respond to business needs; and provide access to training for displaced workers. The Partnership was created to act as a catalyst to bring together employers with specific training needs with education or other non-profit institutions that can design programs to fill those needs.

Through matching grants, the Partnership funds programs that are intended to fulfill short and long term objectives. In the short term, employers experiencing skills shortages will be able to employ workers trained to meet those needs. In the long term, the goal of the Partnership is to "promote the economic interests of Minnesota citizens through closer cooperation between the state's businesses and the education, employment and training systems of the state."

Partnership funds are matched by the equal contributions of potential employers. The employer match, representing significant involvement by business, insures that the training is designed to meet specific needs and leads to identified employment for the trainees.

In its first twelve months, the Partnership awarded 11 grants, totalling $586,000, with an additional $870,000 generated in employer contributions. Over 1,000 individuals were trained in such diverse areas as computer technician, electronic assembler, business manager, machinist, and over-the road driver.

For more information on the Minnesota Job Skills Partnership contact: Monica Manning, Executive Director, Minnesota Job Skills Partnership, 406 Capitol Square Building, 550 Cedar Street, St. Paul, Minnesota 55101, (612) 296-0388.

RESOURCES

"CAD/CAM: Are You Ready?" Video Tape

Is the American worker ready for automated factories? What does the future hold for the assembly line worker? What impact will Computer-Aided Design and Computer-Aided Manufacturing have on the blue-collar work force? How does a person prepare for automation to keep a job?

A video tape of the teleconference, "CAD/CAM: Are You Ready?" addresses issues concerning workers now in occupations using manual skills who may in the near future be required to use CAD/CAM skills to stay employed.

The teleconference presents CAD/CAM future trends and examples of the technological developments in today's industry. A discussion of specific applications of CAD/CAM in engineering, manufacturing, graphic communications, and information management is included, along with information about career opportunity and steps for workers to prepare for future jobs due to automation. The video tape of the teleconference, held March 15, 1985, was produced by Milwaukee Area Technical College-WMVS, a PBS affiliate, in conjunction with Sandia National Laboratories.

A follow-up session is suggested to review trends of local automation, job opportunities, educational opportunities, and career planning resources. The site moderator guide is included with the tape to plan for effective use of this two-hour tape.

The two-hour program and guides may be purchased for $350. **For information, contact: MATC CAD, 1015 North Sixth Street, Milwaukee, Wisconsin 53203, (414) 278-6743.**

Closing the Information Gap: Ways to Improve Student Awareness of Financial Aid Opportunities, A Report of the National Student Aid Coalition, January 1985.

The major concern identified in this report is that information on student aid programs often does not reach those who most need the aid, including nontraditional, disadvantaged, and minority students. An additional concern is that the information that is provided is often inaccurate, out of date, or hard to understand. This report recommends steps to improve both the ways in which information is provided to disadvantaged, minority, and nontraditional students and the quality of financial aid information that all students receive. The report also examines how state grant and loan agencies provide information on student aid and discusses a variety of model and innovative projects that local and regional organizations have developed to address the information needs of students. Appendices include a list of contact persons for the model and innovative programs. **Copies of the report are available for $3.00 each from the National Student Aid Coalition, One Dupont Circle, N.W., Suite 540, Washington, D.C. 20036.**

The Competency-Based Adult Education Network Occasional Paper

Sponsored by the U.S. Department of Education, this newsletter contains information, articles, and resources relating to competency-based adult education (CBAE). The March 1985 issue, for example, contained: an article on three state CBAE programs; a survey of the state-of-the states for CBAE for fiscal years 1981 through 1985 - commitment and funding; an ESL update; and information on the National External Diploma Program Council, Revised Adult Education Bibliography, and Career Redirections for Adults. In addition, a list of CBAE resources available from the Department of Education was included.

For more information, write: Office of Vocational and Adult Education, Division of Adult Education, U.S. Department of Education, Washington, D.C. 20202-3585.

Employment-Based Tuition Assistance: Decisions and Checklists for Employers, Educators, and Unions by Gerard G. Gold, National Institute for Work and Learning, 1985.

Tuition assistance programs have become an important mechanism for the funding and organization of adult learning programs in the United States, as rising costs for postsecondary education compete for the financial resources of individuals and families. This handbook, just published by NIWL, is aimed at both practitioners and policymakers. The volume addresses policy, design, and implementation questions that shape tuition assistance (TA) programs. It provides detailed checklists to help employers, educators, and union leaders use and assess existing TA programs and design new ones. A model corporate TA plan is also included.

Copies are available for $6.00 each prepaid from: NIWL, 1200 18th Street, N.W., Suite 316, Washington, D.C. 20036, (202) 887-6800. Discounts are available on orders of five or more copies.

The Missing Connection Between Business and the Universities by Ernest A. Lynton, American Council on Education/Macmillian Series on Higher Education, 1984.

This book examines the current state of coporate education and the role played in it by colleges and universities. Lynton offers a "comprehensive, critical framework for bringing both business and higher education into the process of upgrading and maintaining the skills" of the workforce. Chapters include a detailed survey of employer-sponsored education, a critical analysis of corporate education's basic policies and programs, and strategies for needed change in universities and colleges to bring about closer collaboration between business and higher education. Lynton concludes with a poposed agenda for joint action and a new model for the university to bring it closer to the world of work.

CONFERENCES

"New Alliances for Jobs in the Future: A Conference for Labor, Education, and Business," October 21-22, 1985, Cincinnati, Ohio.

Information on this conference, sponsored by the Council for the Advancement of Experiential Learning East Central States Region, may be obtained by writing: Division of Continuing Education, University of Cincinnati ML # 146, Cincinnati, Ohio 45221, (513) 475-6932.

"Meeting the Challenge of Change: New Demands and New Responses," Annual meeting of the Association for Continuing Higher Education, October 27-30, 1985, Atlanta, Georgia.

For information contact: Dr. Louis Phillips, Associate Director, Georgia Center for Continuing Education, Athens, Georgia 30602, (404) 542-3561.

"Workplace Learning," Far West Adult Learners Conference, October 28-30, 1985, San Francisco.

Sponsored by the Commission on Higher Education and the Adult Learner, a project of the the Council for the Advancement of Experiential Learning (CAEL), American Council on

Education, and the University of Maryland's University, College, the conference theme "Workplace Learning" was chosen as a result of strong recommendations from the first two conferences (Sacramento, 1983, and Long Beach, CA, 1984.) CAEL's Far West Regional Manager, Urban Whitaker, says that two vital facts influenced the selection of the theme: 1) all of us are lifelong experiential learners; and 2) most of us spend most of our waking hours working. "When we don't use the workplace as a learning environment," says Whitaker, "we are wasting a precious national resource."

For more information write to: The Learning Center, P.O. Box 27616, San Francisco, CA 94127, (415) 334-3196.

"Lifelong Learning: Key to Living," National Adult Education Conference, November 6-10, 1985, Milwaukee, Wisconsin.

For detailed information, contact Molly Padgett, American Association for Adult and Continuing Education, 1201 16th Street, N.W., Suite 230, Washington, D.C. 20036.

The Resource Agent Project is supported by
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THE EAR

Education
and the
Economy Alliance Report

Information for those involved in education for a changing economy. A service of the Resource Agent Project, the National Institute for Work and Learning.

SPRING 1986

PROJECT PROFILES

The PIC/Higher Education Collaboration Project

This recently completed FIPSE Alliance project sought to discover ways that colleges and universities could work more closely with the federally funded Job Training Partnership Act (JTPA) to help the unemployed find work and to encourage business start-ups and expansion. Toward that goal, the National Association of Private Industry Councils (NAPIC) in cooperation with the National Institute for Work and Learning (NIWL) encouraged partnerships between postsecondary educational institutions and Private Industry Councils (PICs) at six sites during a two-year demonstration project.

During the project, which ended in the fall of 1985, NAPIC and NIWL provided a variety of technical assistance including workshops, on-site visits, and a newsletter. Neither the colleges nor the PICs were given funds to explore these new collaborative arrangements. Despite the absence of a direct financial incentive to participants, the results of the project were encouraging, according to a just-released summary of the project, New PIC/Postsecondary Partnerships: How Postsecondary Institutions and Private Industry Councils are Working Together to Boost Economic Development and Put People Back to Work.

Among the collaborative activities at the six demonstration sites were the creation and development of business "incubator" projects in Flint, Michigan; Shippensburg, Pennsylvania; Dunkirk, New York; and in several sites in Northwest Pennsylvania. These incubators generally provide: space for new businesses in a building with shared services; management, financial, and technical assistance provided by educational institutions; and recruitment and customized training of new employees through the PICs.

In addition, the project led to the creation of new relationships between PICs and higher education, including a new educational advisory council in Northwest Pennsylvania. At other sites, JTPA trainees (particularly laid-off adult workers) were integrated into college campuses, and short-term intensive skills training programs were developed for JTPA participants at local colleges. As a result of the project, PICs and postsecondary education at a variety of locations are working together to address local education and job training problems of common concern.

To obtain more information on the project, contact: Shirley Fox, National Institute for Work and Learning, 1200 18th Street, N.W., Suite 316, Washington, DC 20036, (202)887-6800. Copies of the project summary ($8.95) and a detailed case study of the six sites ($11.95) can be obtained from NIWL's publication department.

The Keeping America Working Project

Jointly sponsored by the American Association of Community and Junior Colleges and the Association of Community College Trustees, the Keeping America Working (KAW) Project is a response to the "forces transforming the American economy." The Project seeks to help business, industry, union, and government leaders understand how the nation's 1,221 community, technical, and junior colleges can meet national, state, and local needs for economic and human resource development. The Project's principal goals are to encourage the development of partnerships between two-year colleges and business/industry, to collect data about these partnerships, and to disseminate this information as a means of extending the number and quality of such partnerships.

Through its Partnership Development Fund, the KAW Project recently awarded 18 minigrants and 11 planning grants involving 68 colleges to support pilot projects designed to enhance collaboration between the college and business/industry/labor; public employers; small business; and high schools. (A list of minigrant winners is available from the Project.)

The College/Employer/Labor Partnership Awards program sponsored by KAW also focuses on college and employer partnerships. The program recognizes two-year colleges that have implemented successful cooperative training programs with local employers. A recent winner was the Los Angeles County Community College District whose project involved three colleges, Lockheed California Company, the International Association of Machinists and Aerospace Workers, and the Engineers and Scientists Guild in retraining 765 laid-off or at-risk aerospace workers.

A series of four monographs is available from the KAW Project. The first volume is Putting America Back to Work: The Kellogg Leadership Initiative. The second monograph, In Search of Community College Partnerships, reports on the results of a national survey on the nature and extent of partnerships between community colleges and business/industry and high schools. The third volume, Directory of Business/Industry Coordinators, lists the names and addresses of more than 200 college administrators responsible for establishing and maintaining effective relationships with local business and industry. Keeping America Working: Profiles in Partnerships examines 50 partnerships across the country.

For more information on the KAW Project and its publications, contact: James McKenney, Associate Director, KAW, AACJC, One Dupont Circle, N.W., Suite 410, Washington, DC 20036, (202)293-7050.

The Action Agenda Project

A consortium of three continuing education programs (Western Montana State College, Kansas State University, and the University of Minnesota-Morris) and the Western Interstate Commission on Higher Education received funding from FIPSE in 1984 to: 1) establish a network among providers serving rural areas; 2) advocate rural issues among professional organizations, funding agencies, and state and federal legislatures; and 3) disseminate information on rural adults, model programs, private funding sources, and consultants.

Four regional conferences were held in 1985, with a number of common themes regarding rural adult education emerging: respect for rural integrity; need for collaboration and cooperation among those serving rural areas; and empowerment of rural adults and rural communities through education. Shared conerns included: limited financial resources for program development and delivery; restrictive financial aid policies; too little attention paid to adult learners at the state and federal levels; and general lack of commitment to rural development. Successful programs were found to be responsive to a specific need embraced by the community as a whole and were respectful of cultural differences and adult autonomy.

Another major focus of the conferences was economic development. Participants shared information on a variety of program models. Some focused on individuals, helping them gain new skills or analyze options. Others focused on communities, helping them become proactive rather than reactive to economic change.

Although their individual agendas varied, conference participants agreed on a rural postsecondary action agenda to form partnerships, disseminate information, influence policy, and establish a formal organization. For more information and a list of publications, contact Sue Maes or Jacqueline Spears, The Action Agenda Project, 1221 Thurston Street, Manhattan, Kansas 66502.

RESOURCES

Two New Publications Available in the Alliance's Postsecondary Education for a Changing Economy Series.

Higher Education and the State: New Linkages for Economic Development by Melvin H. Bernstein addresses higher education's growing connections to economic development and state legislatures. The paper presents a case study of the FIPSE-sponsored New England Board of Higher Education's project that involves working with state legislators in the six New England states to broaden understanding of the relevance of economic changes to the financing of higher education. Four other noteworthy state partnerships are described, as well as the role of higher education in the economy and its new responsibilities to state legislatures.

Higher Education Partnerships: Practices, Policies, and Problems by Gerard G. Gold and Ivan Charner identifies the new kinds of partnerships that are emerging between higher education and other organizations. The paper defines and describes three categories of partnerships and examines who participates in collaborative projects and who benefits from them. Throughout the paper examples of higher education partnerships are provided, the majority of which are taken from Education and the Economy Alliance projects.

Regular EEAR subscribers will be receiving complimentary copies of both papers. Additional copies will be available for $5.00 each from NIWL, 1200 18th Street, N.W., Suite 316, Washington, DC 20036, (202) 887-6800.

The College Board Guide to Going to College While Working: Strategies for Success by Gene Hawes, The College Board, 1985.

This book offers plans of actions, "strategies for success," for working adults who are considering college enrollment. It is designed to help potential students assess their interests, identify and select appropriate colleges and programs, and locate sources of financial aid. Actual case histories are detailed, and worksheets for planning, scheduling, making decisions, and recording actions are included. Copies are available for $9.95 each at bookstores or by mail from: College Board Publications, Department E14, Box 886, New York, New York 10101.

Different Strokes for Different Folks: Access and Barriers to Adult Education and Training by Ivan Charner and Bryna Shore Fraser, National Institute for Work and Learning, 1986.

This report, prepared for the U.S. Congress' Office of Technology Assessment, examines how well the formal education and training system serves the needs of adults facing career transitions. The array of education and training opportunities for adults is explored as well as the numbers of participants, institutions, and types of education/training offered. Patterns of adult participation are analyzed, specifying the demographics of participation, the reasons for participation, and the barriers to participation.

Five exemplary education and training programs are analyzed (four of these are members of the Education and the Economy Alliance), and common themes are identified. Collaboration, flexible curricula and scheduling, active participation of learners, support services, and combinations of methods of instruction are identified as critical elements that make for successful programs. Copies of the report are available for $10.00 from NIWL, 1200 18th Street, N.W., Suite 316, Washington, D.C. 20036, (202)887-6800.

Employer Educational Assistance: Who Pays, Who Benefits and Taxation of Educational Assistance to Employees by the American Society for Training and Development, 1985.

The first publication reports on a survey of 319 employers, representing a cross-section of industries. Ninety-seven percent of the respondents said they offer educational assistance of some type to employees, with community colleges cited as course providers by 90 percent of the respondents. Findings on eligibility, participation rates, costs, course content, and managerial assessment of assistance programs are also included. The second booklet describes - in question and answer form - tax laws and regulations applicable to educational assistance programs.

For more information, contact: ASTD, 1633 Duke Street, Box 1443, Alexandria, VA 22313.

"The Learning Enterprise: A Report on the Size and Scope of Training."

In the January 1986 issue of Training & Development Journal, Anthony Carnevale, chief economist of the American Society for Training and Development (ASTD), looks at the current size, scope, and influence of workplace training and development. The article notes that corporate learning has become a $30 billion industry and is likely to grow larger still. Employers provide at least 17.6 million formal courses each year to almost 15 million trainees.

Accompanied by fourteen charts, the article looks at: sources of training and retraining by occupational group; employee training by industry and occupation; percentage of trainees in in-house and outside training; distribution of outside training by providers (four-year colleges and universities provide 34.9 percent of outside training, while two-year colleges and technical institutes provide 18.6 percent, representing the two largest sources of outside training); and costs and benefits of workplace learning.

For further information, see the January 1986 issue of Training & Development Journal, pp. 18-26.

ProEducation Magazine Available by Subscription.

Published quarterly during the academic year, this magazine seeks to present "as objectively as possible" information about the full range of partnerships in education. Recent articles included: "Higher Education

Partnerships;" "Higher Education Meets Industry's Training Needs;" and "Educating Together in Rural Iowa." Subscription price is $12.00 annually. Contact: ProEducation Publications, 5000 Park Street North, St. Petersburg, FL 33709.

Technology and Structural Unemployment: Reemploying Displaced Adults by the U.S. Congress, Office of Technology Assessment, 1986.

This volume was prepared in order to assess the reasons and outlook for adult displacement, to evaluate the performance of existing programs serving displaced adults, and to identify options for improving services. The report focuses on the problems of displaced blue-collar and nonprofessional white-collar workers, as they are most likely to face extended periods of unemployment and re-employment only at lower pay. For many blue-collar workers, retraining offers the best way back to a good job.

An overview of federal programs that provide retraining is included as well as an evaluation of how effectively public and private programs are meeting the needs of displaced workers. An entire chapter is devoted to "Adult Education and Displaced Workers." The full report (445 pp.) and a summary of the study are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 or by calling the Office of Technology Assessment Publication Request Line at (202)224-8996.

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THE BUSINESS DEVELOPMENT AND TRAINING CENTER:
A CASE STUDY OF AN EDUCATIONAL MAINTENANCE ORGANIZATION

INTRODUCTION AND BACKGROUND

Today the Business Development and Training Center (BDTC)[*] runs an education and training center in the largest corporate park in the East, provides a variety of academic and career counseling services, coordinates such disparate activities as a consultant file, a Career Connections Job Service, and numerous special interest groups, and publishes a newspaper with a circulation of twelve thousand.

How did it start? What are the critical elements of the educational maintenance idea and how does it became a reality? This case study provides the answers to these questions and explores what was learned about integrating education and work in the process of developing a new approach to education and human resource development.

The BDTC was a joint project of the Compact for Lifelong Educational Opportunities (CLEO) and the Great Valley Corporate Park in Malvern, PA. The Corporate Park was developed by Bill Rouse to be the "workplace of the future" and CLEO was a consortium of postsecondary institutions in Southeast Pennsylvania, created to attract and provide services for the new adult learner. CLEO's initial objectives were to:

- attract adult learners back to further schooling through use of print media, public service announcements on radio and TV, and public information sessions in various sites around Philadelphia and the adjoining 4 counties:
- provide academic and career counseling; "hotline" information on courses and programs available in member institutions; and assessment of prior learning:
- provide faculty and staff development activities to support the kinds of change needed if adults were to be well served by higher education.

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[1] The BDTC was one of 24 projects that comprised the Education and Economy Alliance. The Alliance is a project of the National Institute for Work and Learning which was supported under Grant Number G 008440477 from the Fund for the Improvement of Postsecondary Education.

Built on the philosophy of the health maintenance organization the Educational Maintenance Organization (EMO) was initially conceived as creating an overall system of educational service and accountability to be shared by employers, unions, education organizations, and individuals.

Taking the EMO idea as its basis, CLEO proposed to develop an Educational Maintenance Organization (EMO) model with the following distinguishing factors:

1. on-going, on-site provision of a variety of training, counseling and other services as need arose;
2. mutual commitment to supporting a multi-faceted human resources program;
3. a financing structure in which corporations would pre-pay for their services.

It was envisioned that by contracting with CLEO, a company would have access to the teaching, research and consultation capacity of 34 major colleges and universities, and could shift some of the burden of human resource management and training to the EMO organization. The colleges would have gained the understanding and experience to reclaim their role as primary providers of educational services to the business world, and the learners would have gained access to learning resources appropriate to achieving their personal and career goals.

The proposal to develop an EMO was funded by the Fund for the Improvement of Postsecondary Education (FIPSE). Today's Business Development and Training Center at Great Valley Corporate Center, while it adheres to the underlying principles of the EMO, bears little superficial resemblance to the creature initially envisioned by those who wrote the FIPSE proposal.

THE BUSINESS DEVELOPMENT AND TRAINING CENTER

In the midst of Great Valley Corporate Center, where stunning contemporary buildings sprawl among the rolling hills of Chester County, Rouse & Associates have preserved a late 18th century Farmhouse. The first floor of the Farmhouse has been renovated for the BDTC's use with an interesting mixture of colonial charm and twentieth century functionalism. One fairly large space was turned into a classroom that can hold 35-40 people. A conference room with a table seating 10-12 remains as a conference room, but with extra chairs can seat up to 20 for a small class or workshop. Some open office space and a small room in the basement that can, in a pinch, be used by part-time staff completes the BDTC headquarters.

Great Valley Corporate Center is marketed as the "workplace of the future," a high tech park which serves as the hub of the emerging high tech Route 202 corridor. The marketing hype has in fact created a reality, confirmed last spring when President Reagan gave one of his speeches in support of the budget at Great Valley and referred to it as the Silicon Valley of the East. Certainly, it is true that there is a high percentage of young, entrepreneurial companies, which makes for a stimulating but volatile atmosphere.

The average size of the companies in the Park is very small. Of the 181 companies in the Park early last spring (that number has increased since then), 140 had 20 or fewer employees, while only two companies had more than 250 employees. The Park is comprised largely of high tech and information services companies, with only 29 percent in such traditional fields as sales and distribution, utilities, and light assembly. Sixty-two percent of the employees in the Park are in high tech or biomedical/chemical/pharmaceutical and computer areas and only 18 percent in sales, distribution and utilities.

A. Start-Up

As part of our start up activities during the summer of 1983, a meeting was held for the Deans of Continuing Education of the CLEO colleges, both to let them know what was happening at Great Valley and to solicit proposals for courses, workshop and seminars for their institutions to be held at the BDTC.

The atmosphere at the meeting was one of guarded interest. Some Deans were frankly paranoid, worried about our attraction to the corporate park students who would otherwise have appeared on their campuses. Others, mostly from the larger institutions, seemed to feel that we had unsurped their role in serving the corporate community and were wary of committing themselves to supporting either the concept or the physical reality of the BDTC. A few Deans, however, saw the BDTC as a genuine opportunity for bringing what they could offer to a new constituency and indicated their hearty support.

In order to put together an initial program that would present higher education in a favorable light, each Dean was asked to give us a list of 3 or 4 courses, credit or non-credit, which represented the best their institutions had to offer. It was stressed that the BDTC was interested in quality and that the courses should be ones where they had particular strengths, such as star faculty, expertise in new areas, or state of the art research. Offerings were solicited not only in finance and management, but in communications, computer science, technical fields, the humanities and life enrichment courses. Since a lot of attention would be focused on our first year's program, and the Deans were asked to help in making it a strong example of postsecondary's education's responsiveness to the needs of business and industry.

The overwhelming response of the group was: a. All of their offerings were excellent, they couldn't possibly make discriminations among them; and b. they couldn't propose anything unless they had more information about the precise needs assessment, again requested that they send us course proposals, and the meeting adjourned.

This meeting was typical of many CLEO had hosted in the past. It was a rare administrator or faculty member from a CLEO institution who was willing to judge ideas on their merit or lack thereof. Instead, the criticism frequently seemed to stem simply out of self interest: "Is the project or activity under discussion good or bad for my college?" There was little consideration of the relative merits of the ideas presented and in general a very narrow view of their own self-interest.

They could not see the BDTC as an opportunity to demonstrate collectively the resources of higher education in the Delaware Valley. The hope was to come away with a program rich in variety, relevance and intellectual depth; BDTC staff left the meeting feeling that they would be lucky if anyone were even willing to offer a beginning accounting course.

The BDTC staff had also hoped that a group of Deans would emerge from that meeting with the vision to work with us to turn the BDTC into a truly responsive and innovative training center, but on reflection realized that neither the arithmetic nor the motivation was sufficient. The arithmetic was particularly bad. If we could offer the equivalent of 5 courses per semester, assuming 3 semesters, that would be 15 courses per year. At that rate, if we were to attempt to apportion these courses fairly among the institutions, each of the 35 would be asked to give one course every other year.

In the months after the Deans' meeting, a few proposals came in; calls were made to contacts at the various institutions and a few more proposals came in. None of them looked particularly "sexy," but staffs experience with business education was limited at that time, and they did not feel competent to make value judgements among them. Therefore, thinking it both politic and practical to shift the burden of decision making away from the BDTC, we decided to use the first meeting of the BDTC Advisory Board for a discussion of program.

For the first meeting of the Advisory Board, a list was prepared of the courses proposed by the colleges for our initial offerings. They were arranged them by subject matter, using the course descriptions as submitted, and had circulated to the Board a few days before the meeting.

What ensued was, in retrospect, probably the funniest, but at the time the most anxiety producing meeting. First of all, these executives took their task most seriously. No curriculum review committee at Princeton or Harvard ever assumed the mantle of responsibility with a stronger sense of carrying the world's destiny on their shoulders. They had done their homework, and arrived at the meeting with copious notes, as well as carefully honed outrage.

The outrage erupted with the discussion of a course titled "financial Management for Non-Financial Managers," offered by the business department of a major university. In the accompanying description it mentioned that the managers would be learning to work with Visi-Calc. "Visi-Calc!" roared the president of a small manufacturing firm. "Nobody uses Visi-Calc any more!"

"We've all switched to LOTUS 1-2-3, growled the Executive Vice-President of an energy resources group. "Why are they still teaching Visi-Calc?"

This exchange set the tone for the rest of the meeting during which they complained that the colleges were still teaching computer science on Apple computers when the business community clearly preferred IBM's, thought they could get a more relevant technical writing course from a local proprietary school than they could from a prestigious private liberal arts college, suggested a consultant who could do a better job of teaching word processing than the local community college, and in general bemoaned the lack of "real world" savvy they discerned in most of the courses on the list.

Another issue that occasioned lively discussion at this meeting was price. Those in academia have long lived with the assumption that the sky is the limit in the business world. Dazzled by reports of the enormous sums that executive seminars command on a national scale and fueled by tales of the riches raining down on private consultants, colleges have begun to upscale their fees when dealing with business clients.

However, the people around the table that morning made it quite clear that cost effectiveness, not the sky was the limit. They questioned the quoted prices for each course. They broke them down to hourly equivalents and compared them institution by institution. They even compared them on the basis of the audience for which they were intended; apparently a workshop for executives can cost more than a workshop for middle managers, which in turn can cost more than one for administrative assistants. The employees' rank on the organizational chart has direct bearing on how much it is appropriate to spend on his or her training.

Cost, however, took a back seat to quality. The Board members were clearly willing to pay more for what they perceived as prestigious universities, and urged us to bring in, presumably at any costs, seminars from Harvard, MIT and Carnegie-Mellon. They were also willing to pay for a course from a local community college which they felt was highly specialized and not readily available elsewhere.

Oddly enough, in the credit-bearing courses, those which demanded the most time and cost the most, these otherwise uninhibited, hard-headed board members were oddly silent. There seemed to be a tacit acceptance of the fact that if an institution were handing out the gold currency of credit, it could do so on its own terms.

The most dismaying comment of that meeting, however, was made by the chairman of the board of a major local bank, who turned to ask me why none of the colleges had ventured to offer a course in philosophy or political science. "I wonder if they really believe in the liberal arts," he said quietly.

Looked at in conjunction with the Deans' Meeting, this incident points up graphically the long way we still have to travel if we are to build bridges between the two cultures.

Quite clearly, the members of the Advisory Board had negative expectations of what higher education can offer them. The course descriptions they read had reinforced their feelings that colleges are unresponsive, behind the times, and out of touch with "the real world."

The BDTC staff was dismayed to realize that proprietary schools and private consultants are presumed to be more useful to business than the resources of higher education. However, in the ensuing two years we have begun to realize that to a limited extent this perception is correct. There are some areas of expertise which colleges and universities not only don't have, but shouldn't necessarily aspire to.

B. Programs and Services

1. On-Site MBA Program

By spring of 1984, the BDTC had identified a core group of about 35 men and women who wanted to pursue a graduate degree in business, but who were reluctant to enroll in an MBA program that would mean traveling into the city, fighting traffic and parking problems. They were eager to have an on-site program developed and were willing to help.

The first step was to invite the Deans of the Business Schools of the major universities to meet with these potential students. Of the nine initial invitees, the Deans of five schools attended. A second meeting with the potential students and the Deans of the three most interested participating universities was followed by a period during which programs, faculty, tuition costs, and general attitudes were compared and finally it was decided to invite St. Joseph's University to bring in their program. At every step of the way, the BDTC worked with and deferred to the judgement of the potential students, which not only made them feel more invested in the program but saved the BDTC from charges of favoritism by the universities.

St. Joseph's University seized the opportunity to extend their reach into the corporate world. They had already established two other satellite campuses within reasonable distance of Great Valley and were able to schedule classes in such a way that a student would be reasonably certain of being able to take most of the required courses without having to go to the city campus. They have even made arrangements with their bookstore for textbooks to be brought to the BDTC at the beginning of each semester.

The program's success has amply justified St. Joseph's leap of faith. There seems to be a steady stream of new and continuing degree candidates, enough to justify two very well filled courses per semester, three semesters per year. The students are pleased with the quality of the program and the responsiveness of both faculty and administrators, and St. Joseph's reputation in the business community has received a substantial boost. The program has enhanced the BDTC's ability to meet the needs of the people in the Great Valley area and has raised its profile in the corporate world.

2. Other Courses, Workshops and Seminars

After an agonizingly slow first six months, the BDTC's training and education programs have really taken off. Initial problems were probably inevitable given its newness on the scene. Because of budgetary constraints public relations efforts were inadequate, and even among those who had heard of it, the BDTC was viewed as an unknown quantity with an imperfectly understood mission. Nearly two thirds of the scheduled courses had to be cancelled. Registrations gradually improved in the spring and summer of 1984, and by the fall the BDTC had fairly respectable registration numbers.

Although most of the education and training is currently occurring on the premises of the BDTC, custom-designed training is clearly an important part of its future. It has been asked to coordinate several programs, and the number of requests are increasing as the BDTC becomes better known. One such program put together for General Electric is a good example of the kinds of company-specific needs that custom-designed training can fulfill.

Within Great Valley Corporate Center there is a relatively small branch of GE specializing in the design and manufacture of control mechanisms for electrical power systems. The company was experiencing problems with quality control which they suspected had to do with the older workers on the line who were untrained in the newer electronics. However, they were forbidden by their union contract from testing the workers to determine their skill levels.

The BDTC brought in Delaware County Community College which designed a 42 week program in the newer electronics. Because the college, not the company, was in charge of it, testing was allowed, and ultimately 22 GE employees participated in the program. At the end of the course, when they learned that they could receive 12-18 credits through assessment, 8 of these employees, all men over 50, decided to go back to school.

This proved to be a win-win situation all around. GE had solved its quality control problem, the college had produced a program which enhanced its reputation and was financially rewarding, the BDTC gained credibility as a resource for setting up training programs, and the employees had both retained their jobs and increased their skills.

Early in the BDTC's first year, staff became aware of people's need to meet people in other companies who shared their professional concerns. As part of its first steps toward assuming responsibility for activities beyond education and training, the BDTC supported the formation of special interest groups, setting up the meetings, publicizing them, serving refreshments, and staffing them until they could stand on their own. Among the groups supported were:

> Toastmasters - many of the people in the Park were finding that as they assumed more responsibility in their companies, they were frequently asked to speak and felt unsure of their abilities. Toastmasters was one of the first groups to form and has been one of the most persistent.

Human Resources Managers - although the smaller companies in the Park typically don't have anyone who is formally charged with responsibility for human resources, there was a group of managers from the larger companies who felt a need to share with their peers. The Human Resource group meets about four times per year, sometimes to discuss a specific issue, sometimes to hear an outside speaker.

High Technology Group - this group has subsequently been incorporated as the Pennsylvania Innovation Network (PIN), part of a national network, and continues to grow and expand both its agenda and its membership.

Secretaries and Administrative Assistants Advisory Group - this is a group that functions as a support mechanism for its members and for the BDTC as well. The women in the group give valuable feedback on the needs and interests of this very important segment of the corporate population.
Investment Club - this group is affiliated with the National Association of Investment Clubs, and is composed of people from many levels of corporate life who wish to learn how to invest in stocks more wisely.

Executive Roundtable - this group, comprised of top level CEO's, meets monthly to share issues, resources, and information. Topics discussed range from venture capital to impact of new tax reform bill on business, to sales and marketing issues.

Business After Hours - this is less a group than a function. The BDTC arranges for one company per month to host a reception at which people can meet and business cards can be exchanged. The receptions are well attended and very popular.

Technical Managers Group - formed at the request of a middle manager in a soft ware company, the group has worked with a consultant who leads discussions of issues of common concern.

Sales and Marketing Group - this group meets for breakfast once a month, at which time one of the members presents his or her marketing strategies for criticism by the others.

3. Career and Academic Counseling

A key theme in the EMO concept is support for the individual' self-directed learning. Using the career and academic counseling resources of CLEO, the BDTC brought a complete array of adult learner support services to Great Valley employees. In the first two years of the BDTC over 500 persons either received individual counseling, used the DISCOVER computer-assisted counseling program, went through the assessment of prior learning program or took CLEP tests at the Farmhouse.

The chart of BDTC activities provides a summary of services provided in years one and two.

BDTC ACTIVITIES

	YEAR 1	YEAR 2
# of participants in BDTC sponsored programs	599	1,323
# of credits earned in MBA program	-0-	294
# of persons receiving academic or career counseling/testing	207	315
# of referrals to colleges and universities	59	84
# of consultant referrals	12	47
# of miscellaneous services to business	63	750

4. The Great Valley News

In September of 1984, the BDTC began publishing a monthly newspaper, twelve thousand copies of 40+ pages with over 20 pages of ads, which is distributed all along the route 202 corridor.

The reason for the success of the GREAT VALLEY NEW is related to the reasons why BDTC's program has been moving towards business services that provide linkages.

The workplace is replacing the neighborhood and the church and maybe even the golf course as the "community" for many people. But this "community" can be fragmented, uncaring or even hostile. The much overused and abused word "networking" becomes increasingly important as traditional ties of family and friends grow more fragile. People in the business community need to be able to share experiences, resources, ideas, strategies. The GREAT VALLEY NEWS has helped form the community in which these things happen. Readers learn what's going on in the new company that moved into the building across the way, they see pictures of themselves and their colleagues at a meeting, they learn about the softball league schedule and the MIT Enterprise Forum and the hotshot management consultant who might help them with their production problem. They find out about opportunities to meet their opposite numbers in special interest groups, and they learn which are the best places in the neighborhood to get a good lunch.

THE GREAT VALLEY NEWS is actually creating a community. It's fun to produce, and even if it were not capable of making a profit, it would still be worth Rouse's support as an effective public relations tool. It is fortunate that the BDTC was in the right place at the right time to get it started.

INCREASED PRIVATE SECTOR INVOLVEMENT IN PROGRAM

In September, 1984 a shift from a college-driven agenda for the BDTC to one that would be more responsive to the needs of the tenant companies in the corporate center occurred. This shift had relatively little to do with the fact that the BDTC was largely supported by Rouse & Associates. Instead, the shift evolved from a growing awareness of how the original mission could be modified to respond to new needs and new opportunities.

Given the genesis of the BDTC under the aegis of CLEO, it was perhaps natural that it should have been assumed that the colleges and universities would be the sole purveyors of training and education at the BDTC. However, quite early on, it became clear that the business sector itself was replete with expertise of all kinds that they were willing and even eager to share.

The first real understanding of the important role the private sector could play occurred when a group representing two major and highly respected legal and accounting firms and a large bank approached the BDTC directors with the suggestion that they put together an Executive Seminar series. Clearly it was in their interest to do so. The small companies in the corporate park represent potentially important future clients, and they could establish an early relationship with them through presenting the seminars.

The Executive seminars were the BDTC's first real success. The firms organized them around current issues in which they had first hand information: copyright laws and software; how to cope with new tax regulations: going public; 401-K pension plans, etc. They were scheduled for 5 to 6:30 in the afternoon once a month, wine and cheese were served, and the atmosphere was easy and collegial. Moreover, they were offered without charge but the BDTC was allowed to impose a modest charge on the participants. The BDTC gained invaluable visibility, a reputation for quality programming, and a modest profit as well. Clearly the colleges had strong competition.

The business community has been supportive of the BDTC in other important ways. A group of young business people who wanted to bring the MIT Enterpise Forum to the Delaware Valley asked it to staff and coordinate the project and do the mailings and registration. There are ten meetings per year, and the BDTC is reimbursed for services plus a generous amount for administrative overhead.

The president of a software company offered to help develop a program to support BDTC recruiting venture, Career Connections, and will lend the hardware on which to run it.

Still another president of an energy company has given free warehouse space for the GREAT VALLEY NEWS, the Rouse organization has helped with public relations, and everyone wants to give free advice.

THE FUTURE OF THE BDTC

In the spring of 1985, as it became clear that CLEO's future was uncertain, the CLEO Board suggested that the BDTC become independent, applying for its own non-profit status and breaking the few administrative ties that remained.

While saddened by the impending demise of the consortium whose future had looked so promising, the BDTC's directors saw no threat to the BDTC's financial status, and also realized that their on-going relationships with many of the local colleges and universities were not in jeopardy. On the plus side, independence presented possibilities for greater flexibility in programming. Therefore, the break was less traumatic then might have been foreseen.

However, when contemplating the long range future of this organization, the question of funding is still crucial. We are expected to supplement the developers and the state's help (Benjamin Franklin partnership funds) with the BDTC's own income, deriving from membership dues, training programs, and services. Upon achieving its own status as a non-profit organization in the summer of 1985, BDTC staff presented as the first order of business for our new Board of Trustees an extended discussion of future funding strategies.

The major goal of this discussion was to strategize how the BDTC could in time become self-funded, eliminating the need for soft money. The Board, which includes accountants and lawyers and people knowledgeable in both the private and public sector, not only examined the BDTC financial history but asked for an accounting of the staff time that went into each of our projects. It was their conclusion that given the deomgraphics of Great Valley Corporate Center and the nature of the resident companies, plus the nature of the services the BDTC was prepared to render, there was very little chance of our achieving fiscal independence.

The original intent had been to get the greater part of our support from company memberships. This was an integral part of the EMO strategy whereby the business community would have a stake in our continued presence. However, despite the success in getting 35 to 40% participation in BDTC membership, there is a core of companies in GVCC that will probably never become members. The EMO concept must undergo modification when the client population consists mainly of young entrepreneurial companies with a short history of any kinds of human resource development activity.

The Board of Trustees feels that by concentrating our major efforts on those activities that are clearly capable of making money (the Great Valley

News, room rentals, computer courses, a new program called Career Connections, the MBA program, and a few others) the BDTC can substantially increase its annual revenues and decrease the amount of outside support to about 1/3 of operating costs.

As a result of the discussions with the Board, the BDTC has begun to modify its expenditure of resources, both time and money. Membership has been made more attractive with an expanded list of benefits; programming of courses has concentraded on those areas in which the BDTC has a track record of success; and the BDTC has been more conscious in choosing which activities and programs are to be carried out as "loss leaders." For instance, the Executive Roundtable series is emphasized even though it is not profitable, because it brings us to the attention of CEO's and has been responsible for increasing membership. On the other hand, the BDTC is pulling back some of its support for special interest groups, insisting that they be willing to fund their own activities.

For the fiscal year - 1986-1987 - the BDTC is carrying roughly 1/3 of its operating costs, a figure which we expect to increase to 1/2 next year. Attendance at courses and other "events" has increased, the BDCT is extending its activities beyond the corporate center to serve the whole "Route 202 High Tech Corridor," and it is clearly coming to be perceived by the business people in the area as a resource. It has become an SBA Resource Center, BDTC staff are the organizers and managers of the Pennsylvania Innovation Network, they have an on-going role as managers of the MIT Enterprise Forum, and we frequently co-sponsor events with such organizations as the World Affairs Council, the Wharton Small Business Development Center, and the Paoli Enterprise Center. The BDTC is also called upon to help major firms present programs for the corporate market, and companies moving into Great Valley Corporate Center frequently seek out the BDTC.

LESSONS LEARNED

The two and a half years of planning, development and operation of the BDTC have been an exciting and frequently frustrating time, but certainly they have been a learning time. This new model, created in the high-minded naivete of the academic world, has had to make a myriad of adjustments to the reality of corporate America. Among the lessons learned are these:

1. There is no question that the need for training and retraining in this transitional economy is enormous, perhaps exceeding the capacity of educational institutions to respond. However, in most small and many medium sized companies, managers either do not perceive that need or are paying it little attention or simply cannot afford to do anything about it. It is in the larger companies that most training takes place or is supported by means of tuition reimbursement. Unless some way is found to aggregate the needs of resources of the smaller companies (a BDTC or a Chamber of Commerce or some other cooperative model), this will remain an under developed market.
2. There is less support for training for blue collar workers unless such support is written into union contracts. The assumption seems to be that blue collar workers are not (and shouldn't be) upwardly mobile. In fact, the pressures of high tech manufacturing and production techniques fall heavily on the blue collar workers, and it is the blue collar jobs that are most in jeopardy as we go through this transition to an information and service economy.
3. There is demand for non-credit on-site courses, workshops and seminars to which many colleges have been slow to respond. The demand is frequently not for "off the shelf" offerings but for a course tailored to meet a specific need. And when a company is experiencing a need, it doesn't' want something promised six months later, after the

curriculum committee has met and the Academic Dean has approved it and the faculty person has a lighter schedule.

4. There is in the business world much skepticism about what colleges have to offer. They have a stereotype (sometimes accurate) about courses that are out of touch with the realities of the contemporary business world, taught by faculty who treat adult students as though they were 19 years old and wet behind the ears. They see much that is irrelevant and dated and impractical in the content, and pedantic and time wasting in the process. This set of perceptions is hard to overcome and means that much time must be spent in building confidence.

IMPLICATIONS FOR INTEGRATING POSTSECONDARY EDUCATION AND WORK

1. Any postsecondary institution interested in doing business with business should first look to its mission and its resources to determine if this is really a priority and if it has the appropriate programs, faculty and administration committed to its success.
2. Colleges should choose only their best faculty to teach off site, and make certain that they want to do it. Unwilling faculty make terrible teachers. Adult learners are fair but highly critical, and they recognize and will not stand for poorly prepared or out of date material and a condescending or inept pedagogical style.
3. Colleges must be prepared to be reasonably flexible when modifications of content or delivery are requested.
4. Colleges should be candid about what they can't do. They shouldn't take on contracts that will stretch their staff resources or that will compromise their academic integrity or that will cause more dissension on campus than they are worth.

5. Colleges should look beyond course delivery to see what other resources they have to offer. A few colleges have begun to offer on-site career counseling or prior learning assessment workshops. Others have done well with "Returning to Learning" seminars or simply by putting an academic counselor into an industrial plant a few days every year. An institution's relationship with the business community shouldn't be just a series of sources. They should be thinking beyond courses to cooperative research projects faculty/executive exchanges, internships, or consulting arrangements.

Relationships between the postsecondary education and business communities are a two way street. Business doesn't have all the money. Colleges don't have all the expertise. Both sectors are looking for rewards. They must work out win/win situations which will build the foundation for true partnerships that are on-going and mutually supportive. The EMO concept and its application through the BDTC show that education and work can be integrated to the benefit of all, organizations and individual employees.

ENGLISH LANGUAGE TRAINING FOR THE WORKPLACE:

A CASE STUDY OF THE LANGUAGE WORKING PROGRAM

I. INTRODUCTION

The number of workers in the United States who are non-native speakers of English is increasing at a rapid pace. In many industrial, manufacturing, and high tech companies it is not unusual to find employees from Central and South America, Asia and parts of Europe. Many of these workers are highly skilled and motivated but their limited proficiency in English hinders them from meeting their full potential. Business and industry have a great need for innovative and effective means of training these workers to increase efficiency and productivity; product and service quality; and worker morale and job satisfaction.

The English Language Training for the Workplace Program (Language Working)[1] was designed to provide relevant, worksite language training for non-native English speakers. Language Working, a program of the Department of Adult and Higher Education, Arizona State University, was funded by the Fund for the Improvement of Postsecondary Education of the Department of Education. Honeywell's Large Computer Products Division in Phoenix Arizona served as the demonstration site for the project. Having completed its two year developmental phase, Language Working has "enriched the lives" of a large number of non-native English workers and has had positive impact on workplace efficiency and productivity.

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[1] The English Language Training for the Workplace Program was one of 24 projects that comprised the Education and Economy Alliance. The Alliance is a project of the National Institute for Work and Learning which was supported under Grant Number G 008440477 from the Fund for the Improvement of Postsecondary Education.

> "The Language Working Program helped employees increase their skills and capabilities and helped the organization improve quality."[2] (Director of Manufacturing Engineering)
>
> "The program will help with training in other areas and will benefit the company." (Training Manager)
>
> "This is a job-related education program that improves language skills and self confidence." (Instructor)
>
> "The program helps good employers be better. My people are trying to use what they learn. It has raised their confidence." (Production Manager)
>
> "It's helping them. There is a great improvement in communication skills and they are more confident." (Group Leader)
>
> "The program helped me read better and communicate better with my manager and co-workers." (Student)
>
> "I'm proud to be in the program. I'm not as nervous when talking to my supervisor. I'm much happier." (Student)

Non-native English speakers face a number of barriers on their jobs: lack of understanding of instructions; inability to ask questions; difficulty reading and writing; difficulty in participating in job training; and little potential for job advancement. As the statements above attest, Language Working has helped workers overcome these and other barriers through an innovative "functional" approach to language training.

How does the Language Working Program work? What features of the program work best? Where are there problems? What is the real impact of the program? How can the program be maintained and expanded? How can the program be replicated?

This case study of the Language Working Program draws on information gained through personal and group interviews; document and material review; and direct observation. The report is written to provide an overall description and assessment of the program as well as an assessment of the various components of the program. The report is divided into four main sections. The first is this brief introduction to the program and to the case study report. The next section sets out the context for the program. It begins by presenting the goals and objectives for the program and then briefly looks at the organizational context in which the program took place. The third section focuses on the elements of the Language Working Program: background, needs assessment, training, materials, and delivery. In the final section the overall program is assessed looking at institutional and program factors as well as program outcomes. It concludes with a brief discussion of how the program bridged the gap between the "education for work" and "liberal education" perspectives on adult learning.

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[2] In certain instances throughout this case study, quotations are used which represent paraphrases of individuals' statements rather than their exact words. This is done in the interest of clarity of communication. In no case was the meaning of the statement altered.

II. PROGRAM CONTEXT

A. Program Goals and Objectives

The workplace provides a rich source of information about language use in our society today. The accelerated pace of change, the increasing dependence on technology, and new styles of participatory management produce a work environment which is highly interactive. Success in all job positions, even at the entry level, now requires high levels of communication skill. New forms of language use are emerging to fit the demands of this language oriented workplace.

An understanding of the dynamics of language in relation to work is valuable to educators because language competence remains one of the essential characteristics of the educated person in our culture. It is equally important to industry because it clarifies the nature of job proficiency in today's language rich work settings. Future approaches to education and training, to be effective must be based on such a practical understanding of communicative proficiency. However, this understanding requires the combined perspectives of education and industry. Only when educators and industry representatives work together can valid theory and practice result.

The goal of the Language Working Program is to develop an approach to English language training, for limited English proficient workers which relates language skills to clearly identified job skills. This overall goal for the program is translated into three specific objectives:

1. To observe and document at one industrial site the language skills needed by limited English proficient (LEP) workers to function effectively in critical job tasks;
2. To utilize this documented information to design and pilot test an on-site "job language" training program for LEP workers; and
3. To document and disseminate the process used in developing this training program so that it may be used in other work and educational settings.

The developers of the program provide a clear and practical statement of the aims of the program.

> Language Working will help to develop the company's most valuable asset its human resources. Through the program, non-native English speaking workers will:
>
> - increase efficiency and productivity,
> - enhance flexibility in adapting to change,
> - participate more effectively in job training, and
> - increase potential for job advancement.

B. The Honeywell Large Computer Products Division, Pheonix, AZ

Honeywell's Large Computer Products Division (LCPD) is a relatively large industrial plant with a number of different work areas and job positions. Of its 3000 employers, 1000 were in assembly production with the remainder in high tech, administrative, and support positions. Many of the assembly workers are Hispanic, Vietmanese, Thai, and Fillipino with limited English Proficiency. At the time the project was being implemented the LCPD was downsizing with resulting lay-offs and internal transfering occuring continuously. In addition, the plant was moving into a "work team" approach from an individual job or assembly approach to production and was moving from a seniority to a performance-based system. Promotions within the LCPD are based on written and skill tests, and in some cases interviews.

It was estimated that within the LCPD 100 workers had serious problems with English with another 50 needing improvement in their English skills. The vast majority of those in the first group worked in product assembly while those in the latter group were engineers, technicians, and secretarial/support workers. A commonly held belief amongst management was that there were a large number of good employees at LCPD who had language problems. Improved English skills would not only help these workers grow as individuals but would also help the organization improve its quality and productivity.

In terms of its demographic and organizational context then, Honeywell's LCPD was "ripe" for an English language program. It had a large population of LEP workers; it was moving into a new system of production; and it had the clear support of the upper management personnel.

III. THE LANGUAGE WORKING PROGRAM

This section outlines in some detail the major elements of the Language Working Program (LWP). The basic idea of the LWP is a simple one: that English can be taught to Limited English Proficient (LEP) workers through an on-site program which is custom designed for the language learning needs of specific groups of workers. The approach is termed functional-notional and is described in Appendix 1. The program consists of the following elements, each of which is described below: observation and documentation of the language skills needed by LEP workers; design of the job language training program; and delivery of the program.

A. Observation and Documentation

From September 1984 through April 1985 observation and documentation took place at Honeywell's LCPD. The purpose of the extensive data collection was threefold:

1. To identify how workers use English on their jobs and at the workplace.

2. To provide multiple perspectives on the language training needs of LEP workers.

3. To provide an understanding of the work environment at Honeywell.

This needs assessment provided critical information used as the basis for designing the curriculum for the job language training program. Data collection involved interviews, observations, and review of written materials. Specific activities included the following:

- Discussions with key contacts to identify areas where LEP workers are located and other key individuals to interview
- Interviews with trainers and key management and supervisory personnel
- Plant tours and video presentation on Honeywell
- Individual and group meetings with managers
- Follow-up interview (using questionnaire) of managers (videotaped)
- Individual and group meetings with group leaders (videotaped)
- Group meetings with LEP workers and their group leaders (videotaped)
- Individual interviews with LEP workers (videotaped)
- Individual interviews with native speaking workers (videotaped)
- Review of written materials including instruction sheets, manuals, memos, and newsletters.

In addition to the interviews extensive observation of individuals and groups of workers took place. These observations included the following:

- Observing Group activities
    - regular informational meetings
    - employer involvement from meetings
    - group training sessions
    - social events
- Observing individuals on the job
    - coming to work
    - breaks
    - leaving work
    - socializing on and off the job

  - interactions with co-workers
  - interactions with group leader
  - doing the job
  - formal and informal training

- o Use of written materials

  - instructional packets for each job
  - routine forms (logs, vouchers, etc.)
  - memos and information sheets
  - informal social writing

- o Observing interaction necessary for job advancement

  - applications
  - interviews
  - testing
  - performance evaluations

Data and information gathered was systematically organized and analyzed. A coding process was devised based on information from other English in the workplace programs and the "functional-notional" framework for curriculum design. Fifty major codes and almost 300 subcodes were identified. Analysis of the data resulted in the identification of a number of "functions" for which the use of the English language is particularly important. These functions became the focus for the design of the curriculum:

Functions Related to Carrying Out Job Tasks

Following instructions
   written--instruction packets for each job
   oral--training
Indicating lack of understanding
Asking questions
Reporting problems
Responding to an evaluation

Functions Related to Social Aspects of the Job

Establishing social contact
Making small talk
Participating in teasing/joking

Functions Related to Advancing at Work

Seeking information
Filling out forms
Interviewing
Taking tests

In addition to information used in the curriculum design, the fieldwork provided an understanding of the attitudes and behaviors of managers, trainers, and co-workers toward LEP workers. This understanding helped in planning the approach to curriculum delivery at Honeywell. In general LEP workers are viewed as "good" employers who work hard and have positive attitudes toward work. They are polite and courteous and very productive. On the negative side, LEP workers are viewed as unfriendly, unable to "take a joke", avoiding difficult work, and failing to get involved in problem-solving. As program staff suggested, these negative views are clearly related to the workers' lack of facility with the English language.

B. Design of the Job Language Training Program

The design of the Job Language Training program began with the development of a functional-notional framework and a set of learning objectives for the overall curriculum. The framework uses the workplace and given work situations as the basis for identifying language functions.

Five training modules were designed around major language functions at the worksite:

1. Training
2. Meetings
3. Breaks
4. Routine Problems on the Job
5. Job Advancement

A common outline was used in preparing the five modules consisting of three core elements: the opening, skill practice, and real-life practice. The syllabi for these modules are organized functionally. In other words, each module is structured around a number of key functions or purposes for language use. Any specific language skills such as grammar or pronunciation are embedded within this functional structure. For example, the module on breaks, which dealt with informal social language, was organized around such functions as sharing personal information, joking, and expressing feelings.

The modules were written utilizing the data and information collected through the observation and documentation. A brief description of each module is provided below. The table of contents for each module is presented in Appendix 2.

> Training deals with the uses of English during formal and informal instructions in job procedures. The major language functions involve understanding directions and asking for clarification. Key concepts involved in instructions include position, sequence, obligation, and conditions. Both oral and written forms of instructions are used.
>
> Handling Routine Problems on the Job concerns the common types of communication that occur everyday among workers. Students practice such functions as reporting problems, asking for information, and asking for help. They learn specific grammar points needed to carry out these functions and discuss the different styles of communication that might apply, depending on who the worker is talking with.
>
> Breaks deals with the social language that occurs in the workplace, especially during break times. Such informal conversation includes sharing personal information, discussing the news, joking, and celebrating such events as birthdays and marriages. Strategies for starting, continuing, and ending a conversation are emphasized in this module.
>
> Meetings introduces the complex skills needed to participate effectively in meetings. Included are functions such as turn-taking, presenting and explaining information, and giving opinions. Students also develop an understanding of the overall discourse structure of meetings. Literacy skills such as interpreting graphs and tables are also practiced.
>
> Job Advancement deals with each step in the process of seeking advancement including reading job postings, analyzing qualifications, filling out activities from vocabulary development to subtle aspects of non-verbal communication and communication style.

Materials developed for each of the modules included: a trainers manual; teaching aids (handouts, transparencies, posters, etc.); and audio-and video-tapes. Each of the five modules not only deals with the functional aspects of English in the workplace or job setting, but also pays attention to a number of critical language elements including: pronunciation/intonation, spelling, grammar, nonverbal communication, style, and culture. As with the modules themselves these aspects of language skill are taught using content drawn from the work environment.

C. Delivery of the Language Working Program

The training program for LEP workers at Honeywell's LCPD began in October 1985. Classes met twice a week for one and one-half hours in conference rooms located the Honeywell plant. Students were given release time to participate in the classes. The training lasted for 18 weeks. Thirty-six students, of Hispanic, Thai, Vietnamese, and Fillipino language backgrounds were divided into three classes based on their skill levels. As one instructor noted, "there are wide ranges of skills among the students in the class, but they are all highly motivated and interested in improving their English."

Using the five modules as the basis for class sessions, the instructors employed a variety of activities' some highly structured and others more open-ended. Each class session involved listening, speaking, reading and writing. During one class session, for example, students read a set of instructions which they had written as a homework assignment. The instructions were critiqued by the class, while the instructor worked on pronunciation, spelling, and grammar. In another class, students watched a training video and were then asked a series of questions about what they had seen. While the primary focus of this session was asking questions and following directions the instructor was on able to work on speaking, pronunciation and communication strategies. As these examples show, by using "real" "everyday" work situations as the vehicle of instruction the training program is able to incorporate all aspects of language learning (grammar, spelling, pronunciation, etc.) within the functional approach to curriculum design.

Student assessment was a critical component of the Language Working program. Four separate but related assessment tools are used in the program:

skills checklists, videotaped interviews, writing sample, and reading test. Each is briefly described.

1. Skills Checklists

A skills checklists was prepared for each module which identifies the skills taught in that module. The checklists are used to rate the students proficiency in using specified language skills on the job. The checklist for the module on Training, for example, asks how well the student understands: 1) simple instructions which state an operation, a part, and a tool; 2) the sequence of instructions; 3) asking for clarification about instructions. These checklists are completed by the student and her/his supervisor prior to and at the completion of each module. Student improvement in the English language skills related to each module are assessed using the checklists.

2. Videotaped Interviews

At the start of the training program a ten minute oral language sample is recorded for each student. The students are interviewed at the worksite by a member of the training staff using a standard interview schedule that asks, for example, questions about the individual's background, job, and strengths and weaknesses; a meeting he/she went to; and weekend plans. The purpose of the interview is to elicit a language sample which demonstrates competencies taught in the training program. Each interview is scored on the following criteria: fluency, pronunciation, amount of information, vocabulary, grammar, nonverbal behavior and complexity. A second interview takes place at the end of the 18 week training program and pre-and post cores are compared to assess student progress and English language competencies.

3. Writing Sample

Writing skills are assessed through an assessment of student writing samples. Each student is asked to prepare a written response to the following:

Describe your past work experience related to a job you would like to apply for. (Answer in complete sentences. Answer as fully as possible.)

Student responses are rated on the following criteria: spelling, punctuation, correct usage, sentence structure, and handwriting. Comparisons are made between pre and post scores on each of the criteria to assess patterns of student progress in writing.

4. Reading Test

A reading comprehension test was developd based on the type of reading required of workers in manufacturing areas. Sample passages were taken from the procedures manuals or "planning packs" that accompany each job at Honeywell. A series of short answers and multiple choice questions were asked about each passage. Scores are analyzed according to pattern and type of errors and pre and post scores are compared to assess progress in reading comprehension.

Through the four assessment tools student progress in all aspects of English language learning are assessed. These assessment tools are an integral part of the training program and thus, go beyond their use in the evaluation of the program. They help the students (and supervisors) understand their skills and competencies which can be used directly on their jobs and in their work environment.

IV. PROGRAM IMPACT AND ASSESSMENT

The Language Working Progeam has met its goal of developing an approach to English language training for LEP workers which relates language skills to clearly identified job skills. The approach is straightforward and sound. It relies on a thorough observation and documentation process (needs assessment) to provide information for the design of the training program. Both the process and the training program easily can be adapted in other work and nonwork settings.

The impact of the program on the 36 LEP workers who participated is clear. Their English language skills improved and they gained proficiency in job related communication. The perspectives of instructors, supervisors, and students supported this assessment.

From an educators viewpoint the program was a success because the students made measurable progress in developing their language skills. Students were assessed holistically through tasks which simulated work place activities. For example, pre-post interviews with each student were videotaped. Students demonstrated dramatic improvement on scales developed to measure skill in a number of areas including, fluency, pronunciation, and nonverbal communication.

From industry's perspective the progras was a success because the students' supervisors could report remarkable changes in job performance that in turn could be related to improved quality and productivity.

> "This program has saved a lot of money. Bad communication is costly. There have been fewer mistakes since the course began. All around my employees are much better. They want to show they have improved. The program is worth company time--its well worth the time."

> "I think the class does save money for the company because of better communication. We get better feedback, improved worker productivity and quality of work. The class has benefitted our area. Workers feel less alienated. They are happier and more productive."

Managers were able to estimate how much money the program had saved the company by considering savings in employee time. Increased communication skill meant less time time was spent explaining procedures and handling problems. One supervisor, for example, reported that for each of four LEP workers in his area he saved approximately one hour per week of the workers time and one hour a week of his own time. Taking an average workers hourly wage of nine dollars and the supervisors wage of 12 dollars, this time saving translates to a dollar saving of eight-four dollars a week or over four thousand dollars a year for just one area.

The students themselves seemed to measure their success in terms of increased confidence and greater comfort in interacting with coworkers and supervisors. They also were ready to take more initiative in reporting problems, making suggestions, and participating in area meetings. Many were for the first time considering applying for job advancement and pursuing formal education.

While the impact of the program on participants is important, the interest of the case study is on the impact of the program on the partnership between the two organizations. The partnership outcomes of the program are discussed on terms of three elements:

- Reciprocal benefits. Both partners must anticipate and receive concrete benefit from the partnership. In addition, each must be cognizant of the benefits anticipated by the other and facilitate their attainment.
- Complementary skills and knowledge. The partners must recognize their need for each other. Each must bring skills and knowledge not possessed by the other that are critical to the project's success.
- Effective working relationship. The partners must establish a structure within which they can effectively interact. The structure must be flexible and dynamic in nature.

A. Reciprocal Benefits

1. Industry Perspective

Because of the changes Honeywell was undergoing at the time when the Language Working Program was being developed, they were very open to participation. Like most companies in the computer-related industries, Honeywell's Large Computer Products Division (LCPD) was "downsizing" and reconfiguring its workforce. As a result, the company was well aware that its reduced workforce would need to be highly and flexibly skilled. The rapid pace of change in the industry would call on the remaining employees to be continually retrained and cross trained. At the same time, the company was undergoing a "culture change" by adopting an approach to participatory management. All employees would be expected to participate in work teams and quality involvement teams to carry out production, solve problems, and provide creative input to company policies. Honeywell needed flexible workers able to learn quickly, think critically, and communicate effectively.

The company recognized that not all employees, though technically skilled, had the communication skills needed to meet the challenges of this new work situation. This was especially true of the limited English proficient (LEP) workers who spoke English as their second language. At Honeywell's LCPD these workers were primarily Hispanic and Southeast Asian in background and most had been working for the company for at least six years. Because these LEP workers were highly skilled and loyal employees, the company wanted to make an investment in developming their communicative competence.

The ASU staff anticipated that the company would expect to see concrete benefits from the project in terms of more productive workers, fewer defects, and ultimately dollars saved. Working with supervisors the staff found they could document the outcome of the project in these terms.

2. Educators Perspective

From an educators perspective, the value of the Language Working Program came from its potential to generate a knowledge base, not previously available, for work-related language instruction. The ASU staff saw this possibility as exciting both theoretically and practically. An important trend in the field emphasized the functional aspects of language learning. This trend was influenced by two perspectives. The pragmantic, which views language in terms of what it accomplishes in the world, and the sociolinguistic, which insists that language be seen within its social and cultural context. Within this theoretical viewpoint, studies of language as it functions in the concrete, outcome oriented world of work are especially interesting.

Practically the functional trend was motivated by a desire to make language instruction more relevant to the needs of learners. Discontent with traditional academic forms of language instruction has been increasing world wide. Students are demanding instruction that can prepare them to use language skills in real world settings, and for most students, the workplace is the most important domain for language use.

The ASU staff wanted to make a practical and theoretical contribution to the field through the Language Working project. The Honeywell participants, realizing this, took the time to provide the detailed information ASU needed. They provided the facilities and resources required to do indepth and holistic assessments of language learning needs. They allowed researchers to interact with employees and provide access to work areas for detailed observations. In addition, the company worked with the staff in preparing materials including videotapes for presentations to professional organizations.

Both Honeywell and ASU benefitted from the Language Working program. Honeywell viewed the program as developing an important aspect of work proficiency that resulted in more productive workers, lower defect rates, and ultimately increased profits. The ASU staff viewed the program as an opportunity to explore an important area of need in language teaching and to develop innovative curriculum to meet that need. These perspectives though different proved to be compatible and mutually supportive.

B. Complementary Skills and Knowledge

The ASU staff required continual help from their Honeywell partners. This was true for a number of reasons. As educators they experienced a kind of culture shock entering the world of industry. They needed insiders as informants to help them enter what was for them a "strange" setting, to avoid breaking the rules of acceptable conduct and to learn their way around. The environment was difficult to negotiate both physically because the buildings were labyrnthian and socially because the organizational structure was complex and dynamic.

Further, although the ASU partners know much about curriculum organization and presentation, they could not make decisions on their own about the content of a language training program for Honeywell because they lacked knowledge about the nature of communication at Honeywell. They needed the expertize of "natives" to identify the purposes and situations for language use in that context.

Honeywell, while generally aware of the problems caused by lack of language proficiency on the part of some employees, did not have the knowledge or skills to define the problem and formulate an educational solution. They realized that their usual strategies for problem solving and that their standard approaches to skills training were not appropriate. On the other hand, previous attempts to rely totally on educators by sending LEP employees out for instruction in general English as a second language courses had failed to produce improvements in communication skill on the job. The company realized they needed to collaborate with educators if an effective instructional program was to be possible.

After six months of interaction between ASU researchers and Honeywell, the language training program describe earlier was designed. It was uniquely appropriate to the workplace in terms of both instructional approach and content.

These situations and purposes, which could not have been derived apriori without the intensive interaction between educators and workers, provided the structure and fabric of an effective language training program. In addition, decisions about scheduling, student placement, and other aspects of the logistics of course delivery could be made based on a thorough understanding of the work context so that the program could be integrated within that context.

Choices of instructional strategy and design of materials could be made with consideration for the characteristics of workers and the forms of training and instruction they were already experiencing.

C. Effective Working Relationship

Although motivation was high to participate, the Language Working project could not have achieved its goals if an effective structure had not been established through which the ASU and Honeywell partners could interact. Despite enthusiasm about expected benefits and mutual respect, educators and employers are most likely to abandon partnerships of this type early on because of differences in customary approaches to work. The participants become frustrated, time and energy is wasted in unproductive effort, and misunderstandings became increasingly damaging. To avoid such negative consequences, the structure of relationships between educators and the workplace must be flexible enough to survive the frequent changes that occur in the workplace. The flexibility involves the ability to adjust quickly to changes in personnel. In a little more than two years, the identity of the Honeywell liaison with ASU was changed three times. In addition many of the key members of the partnership changed their job positions and locations within the company several times when major staff reorganizations occurred. Each time such a "break" occurred in the partnership, quick action was required by both Honeywell and ASU to repair the damage and protect the working relationship.

Flexibility was also required in terms of the direction and scope of the project as information emerged about the communication in the workplace that had implications for who needed to be involved in the partnership. For example, as workers were identified with potential need for training in communication skills, new managers and supervisors had to become involved in the planning. As the importance of the job manuals became evident, the staff needed to interact with the planning engineers who produced them and the personnel responsible for using the revising them. On the other hand, some changes meant less involvement for some individuals who were originally quite centrally involved. As the company decreased its reliance on temporary workers, for instance, it became less important to involve those staff members who were responsible for temporary workers.

To maintain the necessary flexibility, the partnership must have a structure which is supported through multiple contracts. For the Language Working project, multiple contacts were established on both sides of the partnership. The first contact between ASU and Honeywell came through the human resources division. The staff maintained this connection after a liaison was assigned to them in the training division. The liaison made certain that several other trainers became well informed about the project. This meant that even if the liaison was unavailable problems could be handled immediately and opportunities would not be missed. On the other side, since the seven members of the ASU staff interacted very closely with each other on all aspects of the project, any member could represent the others in interaction with Honeywell if this became necessary. In most cases Honeywell could get immediate attention from ASU when problems arose or communication was necessary.

In addition, meetings were held at Honeywell with mid managers and first line supervisors so that information about the project was widely available. A number of these individuals showed special interest in what they heard and became key providers of information for the ASU staff throughout the project. Through these managers and supervisors the project was able to extend its web of relationships horizontally to other supervisory staff and vertically to workers and to upper management.

Several months into the project, the ASU staff and its Honeywell liaison made a presentation to upper management and gained official endorsement at this level. In addition, one member of the vice president's staff was especially vocal in supporting the project. The staff followed up on his expressed interest and he became a key part of the partnership.

The complex net of connections between ASU and Honeywell provided continuing communication. The ASU staff could share frequent progress reports and receive reactions and suggestions from a cross section of employees. These employees from their various perspectives within the company could keep the staff informed about actual and potential changes in the workplace that might have an impact on the project. They could answer questions as they arose and help locate other information.

Supported through both formal and informal relationships, the Language Working partnership remained strong and highly visible. Because the company's support for the project was well known, the project had a legitimacy that made employees more willing to become involved and to provide access to information and observation. The visibility of the project meant that some individuals sought out ASU staff and volunteered their help. It was relatively easy to introduce new people to Language Working since most workers already shared a basic level of knowledge about the project.

Liberal Education For Work

By structuring a partnership that allowed input and direction from both education and industry, the Language Working project was able to achieve objectives associated with both the education for work familiar to industrial trainers and the liberal education familiar to university faculty. Although the contexts for learning associated with a training center and a college classroom at first appeared disparate, the compatibility of their educational goals became apparent as the partners worked together on a specific instructional program. While abstract discussions may emphasize differences between vocational and academic education, applied work on a concrete learning situation revealed the commonality of the underlying skills required for success in both contexts.

The Language Working training program helped to develop the kind of worker that industry wants and liberal education promotes: an individual trained to communicate effectively, think critically, make decisions, and work as part of a team. The program emphasized the dynamic language skills required to cope with the changing nature of today's work environments. Worker-students learned strategies for adapting to change and for acquiring and imparting new knowledge.

Focusing on generic competencies necessary for creative work and independent learning, this context specific, job-related program was consistent in goals with the most traditional of liberal arts coursework. The collaborative effort that went into developing the Language Working project refutes the current rhetoric decrying the increasing gap between education for work and liberal education. A single program can achieve the purposes of both if an effective partnership is first established.

APPENDIX 1

THE FUNCTIONAL-NOTIONAL APPROACH

The functional-notional syllabus design originated in Europe, where the Council of Europe sought a common unit-credit standard and a means of teaching adults with specific communicative needs. Based primarily on semantic theory and the study of speech acts, it attempts to tie together the semantic, sociocultural, and linguistic elements of communication for pedagogical purposes.

Functions refer to the hundreds of purposes for which people communicate, either orally or in writing. They are subsumed under general categories such as "imparting and seeking factual information," "expressing and finding out intellectual attitudes," "expressing and finding out emotional attitudes," "expressing and finding out moral attitudes," "getting things done (suasion)," and "socializing."

Notions refer to the meanings expressed through linguistic forms, such as time and time relations, quantity, space and spatial relations, probability and possibility, intention and obligation.

The major characteristics of a functional-notional approach are: (1) They stress what people do with language. While grammar and vocabulary are incorporated, they are not placed at the center of strictly functional courses. The title and focus of a lesson, then, might be "Seeking Information about Past Events," rather than "Preterit versus Imperfect," although some of these verb forms would be learned as essential for carrying out the function. (2) Planning a syllabus for a particular course begins with an assessment of the communicative needs of the students. What functions will they need to perform? (3) An effort is made to specify levels of proficiency on the basis of the identification of communicative needs. The first level to described was the "threshold level," at which learners should be able to get along socially and communicate most of their needs during a visit to a country where the language is spoken, or in interaction with foreign visitors.

The advantages of a functional-notional approach are many.

(1) Learners are motivated by being able to experience language study that is directly related to their specific goals and needs.

(2) This approach involves learners in functional communication from the earliest stages of learning. Communication is not left for the second or third year of study, when most students have abondoned the cause, and those who have remained are forced to repeat the study of the same grammar without having achieved proficiency in its use.

(3) In the case of English in the workplace programs, language usage is constantly reinforced by the worksite and the instructional classroom.

(4) The functional-notional approach offers a potential solution to the problem of combining the study of language and culture. The syllabus could conceivably include any communicative experience to the extent that it can be stated in functional or notional terms.

APPENDIX 2

Contents of Five Modules

MODULE A: TRAINING

1. INTRODUCTION
    - Uses of English in Training
2. BEING AN ACTIVE TRAINEE
    - Interrupting and Saying You Don't Understand
    - Asking for Repetition
    - Asking About Word Meanings
3. WHAT TO DO
    - Understanding Instructions - Actions/Parts
    - Understanding Instructions - Tools
    - Asking for Clarification - What to Do
    - Review Practice
    - Describing a Job
4. WHERE IT GOES
    - Understanding Instructions - Position
    - Asking for Clarification - Position
    - Review Practice
5. WHAT COMES FIRST
    - Understanding Instructions - Sequence
    - Asking for Clarification - Sequence
    - Review Practice
6. WHAT MUST I DO
    - Understanding Instructions - Obligation
    - Understanding Instructions - Negative Obligation
    - Understanding Instructions - Possibility
    - Asking for Clarification - Obligation
    - Review Practice
7. HOW TO DO IT
    - Understanding Instructions - How Exact
    - Understanding Instructins - Tolerance
    - Understanding Instructions - Other Qualifiers
    - Asking for Clarification - Qualifiers
    - Review Practice
8. WHEN TO DO IT
    - Understanding Instructions - Descriptions
    - Asking for Clarification - Descriptions
9. WHY TO DO IT
    - Understanding Instructions - Why
10. COMMUNICATIVE ACTIVITY FOR THE OVERALL MODULE
11. POST TEST

MODULE B: MEETINGS

1. START UP OF MEETING
    - Social Talk
    - Starting, Continuing & Ending a Conversation
    - Confirmations
2. ADDRESSING SPECIFIC PROBLEMS
    - Giving Explanations
    - Clarifying
    - Acknowledging
    - Giving Opinions
3. FINDING SOLUTIONS
    - Giving Explanations
    - Clarifying
    - Seeking Information
    - Agreeing/Disagreeing
    - Expressing Certainty/Uncertainty
    - Responding to Evaluation
4. ROUND ROBIN DISCUSSION
    - Giving Explanations
    - Clarifying
    - Giving Instructions
    - Giving Opinions
    - Asking Questions
5. GRAPHS AND CHARTS
6. CLOSING THE MEETING
    - Giving Information
    - Social Talk

MODULE C: BREAKS

1. WARM UP
    - Introduction
    - Segment #1: Talking About Food
    - Segment #2: Sharing Photos
    - Segment #3: Signing a Card
    - Segment #4: Talking About the News

2. SHARING PERSONAL INFORMATION
    - Introduction
    - Talking About Activities
        - Dialogue
        - Discussion Questions
        - Grammar Points
        - Review
    - Talking About Relationships
        - Dialogue
        - Discussion Questions
        - Varied Expressions
        - Grammar Points
        - Review Practice

3. BEGINNING, CONTINUING AND ENDING A CONVERSATION
    - Introduction
    - Begining a Conversation
    - Continuing a Conversation
    - Ending a Conversation
        - Gossip
    - Review Practice

4. EXPRESSING FEELINGS
    - Introduction
    - Alternate Expressions
    - Structures - Linking Verbs
    - Review Practice

5. JOKING
    - Introduction
    - Types of Jokes Illustrations
    - Review Practices

MODULE D: ROUTINE PROBLEMS ON THE JOB

1. INTRODUCTION
2. COMPLAINING
    - Introduction
    - Dialogues
    - Varied Expressions and Paired Practice
    - Grammar Practice
        - Noun Plurals
        - Subject Pronouns
        - Review
        - To Be - Past Tense Negatives
        - To Be - Affirmative and Negiative Contractions
        - Word Opposites
        - Conditionals
        - Review
    - Role Playing
3. ASKING FOR HELP
4. ASKING FOR ADVICE
5. ASKING FOR INFORMATION
6. ASKING FOR THINGS
7. DIALOGUES - STYLES AND CULTURE
8. SIMULATION
9. WRITING PRACTICE

MODULE E: JOB ADVANCEMENT

1. INTRODUCTION TO MODULE
    - Introduction of Functions

2. OPENING VIDEO
    - Discussion Questions

3. READING THE JOBS POSTINGS
    - Introduction
    - Definitions of Job Coding & General Information
        - Reading the Description of Job Positions
            - Job Coding
            - Job Responsibilities
            - Minimum Job Requirements
            - Job Description Structures & Phrases

4. DETERMINING JOB QUALIFICATIONS
    - Introduction
    - Activities
    - Discussion
    - Analyzing Your Skills
    - Cultural Discusssion

5. FILLING OUT A JOB APPLICATION
    - Introduction
    - Activities
    - Reading Passage
    - Job Application Vocabulary & Activities
    - Parts of a Job Application

6. PREPARING A RESUME
    - Introduction
    - Reading Passage
    - Activities

7. INTERVIEWING FOR A JOB
    - Giving Information Formally
    - Successful Strategies
    - Cultural Considerations

8. UNDERSTANDING NOTIFICATION OF OUTCOME
    - Determining Reasons
    - Making a Job Advancement Plan

TECHNICIAN TRAINING FOR WOMEN AND MINORITIES:
A CASE STUDY OF THE INTENSIVE IN-PLANT TRAINING PROGRAM

I. INTRODUCTION

For many adult workers, especially women and minorities, the prospect of career mobility is dependent on further education and training. Within industries faced with critical shortages of trained technical personnel, it is not unusual to find women and minority workers who are highly motivated but who have not had opportunities for advancement and have had little opportunity to participate in education and training. There is a great need for innovative and effective means of moving these workers from lower-paying assembly line jobs to better paying and more rewarding technical positions.

The Intensive In-Plant Training (II-PT) Program[1] was designed to provide technician training and upward mobility for women and minorities who have not had the opportunity for advancement or postsecondary education and training. The II-PT program, a joint program of Rio Salado Community College and Motorola, Inc. in Phoenix Arizona was funded, inpart, by the Fund for the Improvement of Postsecondary Education of the Department of Education. Having completed its three-year developmental phase, the II-PT program has 78 graduates who have moved from the assembly line into electronic and semi-conductor process technology positions. The program also has had a positive impact on the organizations efficiency and productivity. The II-PT program addresses a number of the barriers adult workers face related to job advancement and participation in education and training.

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[1] The Intensive In-Plant Training Program was one of 24 projects that comprised the Education and Economy Alliance. The Education and Economy Alliance is a project of the National Institute for Work and Learning which was supported under Grant Number G 008440477 from the Fund for the Improvement of Postsecondary Education.

How does the Intensive In-Plant Training program work? What are the key features of the program? What works best and where are there problems? What has been the impact of the program?

This case study of the II-PT program answers these questions. It draws on information obtained through interviews and document review. The report is written to provide an overall description and assessment of the program, and is divided into four sections. The first is the brief introduction to the program and to the case study report. The next section sets out the context for the program. It begins with the goals and objectives for the program and then briefly examines the organizational contexts in which the program took place. Section three focuses on the elements of the program. In the fourth section the impact of the program is explored and the overall program assessed.

II. PROGRAM CONTEXT

A. Goals and Objectives

The Intensive In-Plant Training program of Rio Salado Community College (AZ) had two major goals. The first was to train technicians to respond to the needs of one local electronics company (Motorola). The second was to provide a means of improved mobility for women and minorities who had not had the opportunity for advancement or postsecondary education and training.

Rio Salado Community College in collaboration with Motorola, Inc. developed a one-year Associate Science degree program, delivered at the workplace, to provide upward mobility opportunities for women and minority assembly line workers in the electronics industry. Technicians in this industry tend to be men while women have tended to fill the ranks of the assembly line. The objective of the program was to move more women and minorities into technician positions by offering a training (and college degree) program which has been adapted to the needs of the industry.

B. Local Context

The II-PT program was a joint program of two organizations. Rio Salado Community College and Motorola , Inc. Brief descriptions of the two organizations will help set a context for better understanding the II-PT program.

1. Rio Salado Community College

Rio Salado Community College is one of the Maricopa Community Colleges. It is a comprehensive noncampus community college dedicated to serving adults with changing educational needs. The college delivers courses and programs in over 250 locations in Maricopa County including public schools, industries, government agencies, hospitals, libraries and community centers. The college is able to respond rapidly to the changing demands of the workplace, community, and adults and offers instructional programs and related services that are student oriented and easily accessible.

Each semester the college enrolls over 12,000 students in credit courses with over 2,000 served through in-plant education and training programs. The college offers general education and occupational programs and a diversity of student services. It fosters partnerships with business, industry, and government to maximize the use of resources to help students meet their educational goals and help organizations meet their training and human resource development goals.

In terms of its philosophy and approach to education and training for adults, Rio Salado Community College was the appropriate educational institution to develop the II-PT program. It had the ability to design and deliver an innovative Associate of Science degree program combining technical skill training, general education, and support services and delivering these efficiently and effectively at the workplace.

2. Motorola, Inc. is a national high tech company with a number of plants in the Phoenix, AZ area. Traditionally, electronic and microprocessor technicians within the company have been men, recruited from outside of the company. While a great deal of training has been offered to these employees, there had been few opportunities for lower level employees to advance into technician positions.

In the late 1970's, the company lost an Equal Employment Opportunity suit, and as part of the "Conciliatory Agreement" with the government, was required to provide opportunities for advancement to a specific category of employees. Five hundred employees would have to be served by whatever program the company chose to develop. Motorola's response to the conciliatory agreement was to offer a technician training program to women and minority assembly line employees. The program would meet the requirements of the agreement and provide the company with the trained electronic and microprocessing technicians it needed.

III. THE INTENSIVE IN-PLANT TRAINING PROGRAM

In 1981, Rio Salado Community College and Motorola, Inc. formed a partnership to design and deliver an in-plant technician training program for women and minority assembly line workers in the company. The major elements of the program are discussed below.

The Intensive In-Plant Training program provides the courses and services necessary to meet the requirements for an Associate of Science degree for either electronic or semi-conductor technician. Normally requiring two-years of full-time study, the 64 credit program has been compressed into one year. The program lasted for 52 weeks with participants in the program 40 hours per week. Courses were concentrated into a 5 week time period with classes meeting 3 1/2 - 4 hours five days a week. Courses met for the same number of hours as traditional programs but were scheduled for five weeks as opposed to 16-18 weeks. The program combined technical skills training with general skills development. The following courses comprised the II-PT program with all students required to take all courses:

- Economics
- D.C. Theory-Introduction to Electronics I
- Speech
- Stress Management
- Drafting
- Active Circuits I
- Integrated Circuits
- Instrumentation
- Digital and Logic Circuits
- Introduction to Algebra
- Math for Technicians
- Freshman English
- General Psychology
- A.C. Theory - Introduction to Electronics II
- Circuit Analyses
- Conceptual Physics
- Active Circuits II
- Pulse Circuits
- Microwave UHV/RF
- Solid State Devices

In addition seminars were given in the following: microprocessing; soldering; experimental design; psychology of management; and resume writing. Finally, all participants took part in on-the-job training cooperative work experience where they actually worked at technician jobs in the plant.

A number of services were also provided to participants. A counselor from the college was available at the worksite one day per week for individual counseling. A group counseling session also was required once per week. One week prior to the start of classes, workshops were held on study skills, assessment testing, career awareness, and career development. Courses in math anxiety, self awareness, coping strategies, and team building were taught in the first weeks of the program to help participants overcome fears and anxieties and to ease them into the education/training situation.

All students accepted into the program in a given year went through the program together. Each class consisted of approximately 26 students who remained together for all classes throughout the year. The courses combine lecture and hands-on experience with computer assisted instruction used for tutorial assistance in electronics areas. All classes and laboratories took place at the workplace. All faculty in the technical skill areas were industry-based. Individual tutoring also was available to the students. Each course that comprises the II-PT program was developed with a standard description, specific objectives, and a set of specific activities to meet these objectives. Each student was tested to assess her/his ability to meet the objectives of each course.

Students were recruited from the ranks of the assembly line workers in the company. A posting system was used to recruit students with far more applying than could be accepted in any given class. Class size was kept to 20-35 per year. Applicants had two interviews which focused on background, skills, and "potential". In 1983, 280 applications were received for 35 program slots.

Motorola formed an internal Advisory Group for the program consisting of engineer managers, senior technicians, and engineers. The Advisory Group assessed the needs of the company and worked with Rio Salado Community College on the content of the courses. The content of the specific courses and of the entire program is Motorola specific under general curriculum guidelines for the Associate of Science degree of Rio Salado Community College. In other words, the requirements for the program are those of the Community College while the specific content of the technical courses reflect the requirements of the company.

Motorola provided the students for the program who were given one year release time. The company also paid their salaries for the year of the program and all applicable tuition and book costs. In addition, Motorola provided a Technical Training Center at the worksite consisting of two fully-equipped classrooms and 18 fully-equipped lab stations. A full-time director, lab technician, and secretary were also provided by Motorola. Faculty, counselors, and tutors were provided by the college which was also responsible for the content, scheduling and delivery of the program.

Placement was the final component of the II-PT program. A formal graduation ceremony was held for the participants with each receiving a $500 bonus for completing the program. Placement into a technician position was not guaranteed. At the end of the year long training program a career day was held in the company. Each program completer answered three questions for a group of program managers and supervisors within Motorola responsible for hiring electronic and microprocessing technicians. Individual interviews were then set up for the "new" technicians. After the interviews offers were made and placements completed. Those participants not offered technician level positions were guaranteed a position at the same level as when they started the program.

IV. PROGRAM ASSESSMENT AND IMPACT

The assessment of the II-PT focuses on the following: recruitment, program impact; and weaknesses. This is followed by a brief discussion of how the program impacted on the relationship between the participating organization.

A. Recruitment

As a direct result of the "Conciliatory Agreement" with the government, Motorola offered the II-PT to women and minority assembly line workers. Recruitment into the program was handled like recruitment into positions. That is, a posting system was used with the responsibility for applying resting clearly with the individual. Despite the weaknesses of such an approach, which will be discussed below, far more workers applied in each year than could be accepted into the program. The weaknesses inherent in using a posting system for recruitment are threefold. First, many of the assembly line workers eligible for the program lack confidence and self-esteem particularly related to their ability to succeed in an education/training program. Individual counseling and advisement is needed to help those workers who are eligible understand the program and their own capacities for succeeding in the program. Second, with placements limited to 25-35 per year many potential applicants will be "scared away" for applying because they may feel they cannot compete with other employees. A formal information session should be convened for all potential applicants. At this session the program should be explained and the timeline presented. Employees should be made aware that the program is ongoing with classes starting each year. Places should be held for those applicants who are interested in participating in future years. Finally, in some cases recruitment should be done on an individual basis. That is, assembly line supervisors and managers should be able to recommend employees for consideration. The opportunity to participate in the program needs to be made available to all of the assembly line employees covered in the conciliatory agreement. Some will need more "help" prior to applying then others and the recruitment process should recognize this.

B. Program Impact

The Intensive In-Plant Training program met its goals of training technicians and providing a means of upward mobility for women and minorities. Ninety-eight percent of all applicants completed the program and 95 percent of the completers were placed in technician positions with the company. The average salary increase after program completion was approximately $2.00 per hour from $8.25 per hour as a assembly line worker to $10.00 per hour as a starting technician. In addition to the promotion from the assembly line to a professional level position with resulting raise in salary, the participants have an increased understanding and appreciation for the role of education and training in their lives. Approximately three-quarters of the "new" technicians continued their education and/or training after the program. This compares with only one-quarter of similar employees in the company.

The impact of the program follows the participants into their new jobs within the company. According to their new managers and supervisors, these new technicians were not only able to perform their new functions but were able to handle stress and manage their own time. In addition, the participants had better interpersonal skills than other employees. The managers and supervisors attributed these social psychological outcomes directly to the nature and structure of the program.

The II-PT program has been successful at overcoming a wide array of barriers often faced by adult learners. Because all participant costs are covered by the company and salaries are maintained, employees do not suffer any financial burden. By offering the program on a full-time basis at the worksite to employees who are on payroll, the time factor is overcome as a barrier. Job responsibilities are eliminated (but not salary) while the participants are part of the program so this does not act as a barrier. The tutorials, support group, and counseling help participants overcome any lack of confidence they may have. Because all courses are offered during regular work hours there are no scheduling problems. The short-duration and concentration may remain a problem for some participants. All courses are relevant to the jobs being prepared for and the length of the program allows participants to complete it in one year. The one-year duration, however, may be too intense for some participants. Information on the program and counseling are provided to all participants to these are no longer problems.

The II-PT training program offers an example of a training program that has adapted to the needs of an industry and a specific group of employees who could not otherwise participate in such a program. This program offers training to a population group which does not seem to be adequately served by the more traditional adult education and training institutions. It is a program that offers opportunity for upward mobility and a college degree for a population of low skilled, low educated minorities and women.

C. Weaknesses

The weaknesses of the II-PT program centers on a number of factors: costs, faculty, and intensity. With regard to costs, the program is expensive. Costs for the program included tuition, salaries and benefits for participants, replacement employees for those in the program, facilities (2 classrooms, and 18 laboratory stations), full-time director, full-time lab technician, and full-time secretary. Per participant cost for the program was over $18,000, not including the salaries and benefits for replacement employees. At such a high cost it is difficult to find other companies that would be willing to implement a similar program. Clearly, the "conciliatory agreement" played a major role in Motorola's decision to invest the time, money, and facilities in the II-PT program.

Second, it is difficult to find part-time electronics faculty to teach in a day-time program. As a noncampus community college, Rio Salado hired its electronics faculty from industry and as a result it was hard to find qualified persons who could work during the day because they often held down a full-time job in the industry. Another community college, with an existing faculty, could possibly have had less difficulty in this area. The problem with other colleges, however, would be related to the length and intensity of the courses which did not follow traditional semester or daily course schedules. A program such as II-PT almost requires its own full-time faculty and facility, dedicated to a program that is intensive and job specific.

The third weakness relates to the affect of the intensity of the program students. It was difficult for some students to complete all courses in one-year and to digest and absorb all the information and skills being taught. There was no room for "slow" students and no options for when courses could be taken. In addition, participants were isolated from the company during the training and this was a problem for some students. The intensive one-year program clearly worked for a number of participants, but for some it was too short, to inflexible, and too classroom-based.

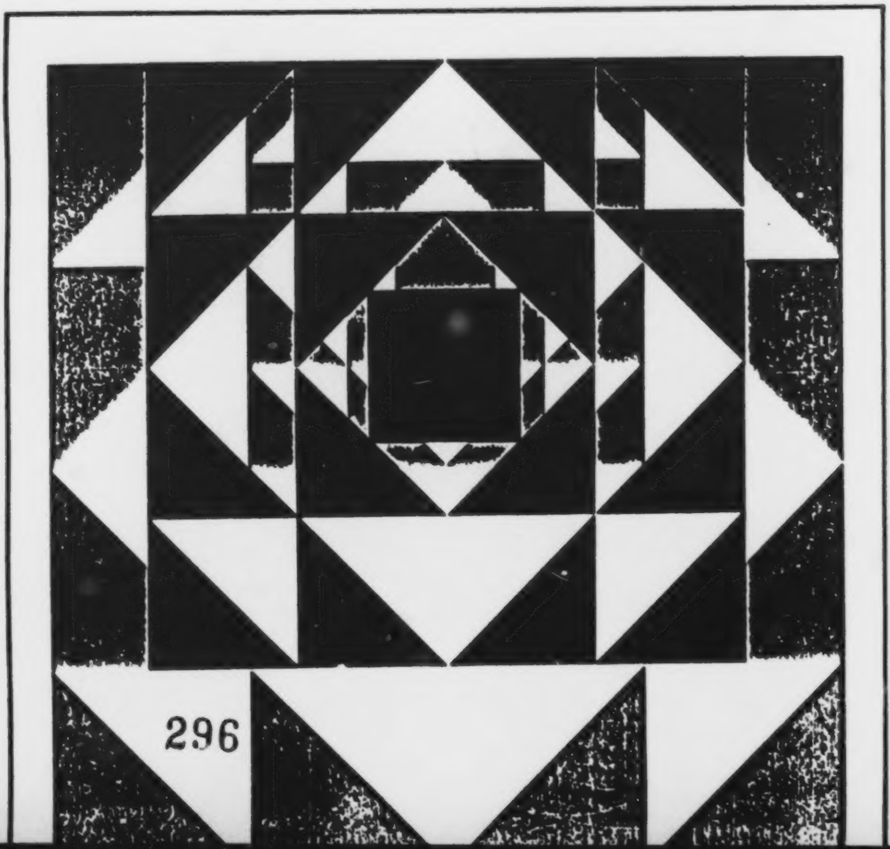
As a result of a conciliatory agreement a partnership between Motorola and Rio Salado Community College was formed to design and deliver a one-year

Associate of Science degree program. The partnership and resulting program provided upward mobility opportunities to women and minority assembly line workers in the company. Unfortunately the end of the program was also the end of the partnership. While both organizations had gained from the experience it was clearly a partnership that was formed for the purpose of this one program. As the program ended, so did the partnership. As the director of the program for Motorola stated, "if we continue the program we will probably move to another college to save money on facilities and improve the teaching." Rather than working with Rio Salado in a partnership to respond to these issues, it was considered easier to "just move the program." The II-PT program was developed through a partnership, but the partnership was not viewed as an objective nor outcome of the experience.

NEW DIRECTIONS FOR CONTINUING EDUCATION

Responding to the Educational Needs of Today's Workplace

Ivan Charner, Catherine A. Rolzinski, *Editors*



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Gordon G. Darkenwald, *Editor-in-Chief*
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Editors' Notes

Integrating education and work for adult workers has a long history and is, today, a growing enterprise. The first corporate school was set up in 1872 to train employees to meet the needs of industry. A little over 100 years later, corporate expenditures on education and training, to meet the needs of both industry and workers, have risen to over $40 billion annually ($210 billion if informal training is included). This sourcebook focuses on the expanding role of continuing and other forms of postsecondary education in relation to institutions of work (broadly conceived) and adult workers. It is particularly concerned with educational responses to changes in the economy—changes resulting from labor-force and demographic shifts, technological advances, and new business strategies and goals. Employers and employees are recognizing the need for continuing education and training in a rapidly changing world.

This volume is based on the assumption that the integration of education and work, whether formal or informal, is critical to the survival of our nation's economy. And, because of demographic shifts and the aging of the population, such integration is imperative to the survival of the education enterprise. The general purpose of this volume, then, is to examine how educational institutions can be responsive to the changing needs of industry and adult workers and to suggest how continuing education can develop and enhance programs that integrate education and work.

This sourcebook is a direct outgrowth of a project supported by the Fund for the Improvement of Postsecondary Education (FIPSE) of the U.S. Department of Education. The FIPSE Education and the Economy Alliance is a group of twenty-five projects concerned with improving postsecondary education's ability to respond to changes in the economy. A list of the projects is provided in the Appendix at the end of this sourcebook. Each project offers a unique lesson in integrating education and work. Six of the projects are highlighted in this sourcebook through short case studies. They were selected, not because they were better or more innovative, but rather because they represent diverse approaches to the issues central to integrating education and work effectively.

As the reader will see, there are a number of common themes that run across these (and the other nineteen) projects. First, these projects are responding to a problem or to a set of problems that directly result from changing economic realities. Second, the population being served by these projects is adults, most of whom are or have been in the work force and can best be served by continuing education. Finally, each of the projects is built on some form of partnership or collaboration between education and other organizations which include businesses, organized labor, and community groups.

The first chapter, by Charner and Rolzinski, establishes the context for the sourcebook. It provides an overview of the economic, demographic, and technological changes facing the economy for the remainder of this century and well into the next. We then present a framework for exploring new ways to integrate education and work in response to these changes.

Chapters Two through Seven present case studies of six endeavors that integrate education and work for groups as diverse as limited-English-proficient workers, rural adults, unions, small businesses, and a corporate park. In Chapter Two, Skinner, Siefer, and Shovers present evidence that only when education and industry truly work together can effective English-language (and other) workplace programs result. Through their case study of an innovative English-language training program, the authors lay out three essential prerequisites to productive partnerships that integrate education and work: reciprocal benefits; complementary skills and knowledge; and effective working relationships.

Langer, in Chapter Three, portrays the development of a computer-integrated manufacturing education center to meet the needs of local industry for "supertechs" who can install, program, and maintain high-technology manufacturing and engineering equipment and systems. The program is designed around computer-based labs that simulate the operating environments of local industries. Through extensive partnerships with businesses, which donate equipment, provide assistance in curriculum design, and offer training workshops, the program integrates education and work not only for recent high school graduates but also for full-time employees in need of retraining.

Chapter Four, by Lamdin and Hassan, examines the development and operation of an "educational maintenance organization" in a large corporate park. The case study of the Business Development and Training Center provides answers to these questions: What are the critical elements of the educational maintenance idea, and how does it become a reality?

Derber's Chapter Five describes a partnership formed between an educational institution and local labor unions in order to help combat the problems of industrial dislocation and upheaval associated with foreign competition and new technology. The resulting "economic literacy" project provides a social, historical, and economic education to workers, giving them the tools to chart their own economic future and to help them analyze, revitalize, and retool their own industries.

As Emery makes clear in Chapter Six, integrating education and work to provide computer education opportunities to rural adults can affect both individuals and communities. The case study examines the development of a computer literacy curriculum and its community-based delivery system. By providing computer, curricular, and human resources to local communities, the project helps to foster local expertise in computer education and in leadership development.

In Chapter Seven, Moebius argues that the increased importance of international markets to local economies requires the development of new business skills and strategies. Small and medium-sized businesses need to be trained in international trade if they are going to compete in the global marketplace. This case study describes the continuing education programs offered by the International Trade Technical Center. The center integrates education and work related to foreign trade for businesses and their employees in order to increase their awareness of the global economy, to facilitate exporting, and to develop new employment opportunities.

Rolzinski and Charner explore the lessons learned from the case studies in Chapter Eight. We then present, in Chapter Nine, a set of critical questions and issues for the consideration of continuing education program developers, practitioners, and policy makers. These questions suggest ways to look at future possibilities for integrating education and work. If continuing education is to respond adequately to changes in the economy, then new policies and practices must be adopted that are responsive to the needs and demands of working adults, businesses, and communities.

It is our hope that this sourcebook will provide examples and insights into strategies for integrating education and work effectively. We hope that the case studies provide practical advice and assistance to continuing educators and others who serve or wish to serve adult workers, communities, and businesses. We also hope to challenge these same audiences to improve the ways in which they address changing demographic and economic realities by developing new partnerships that meet the specific needs of adult learners in their localities.

Ivan Charner
Catherine A. Rolzinski
Editors

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Both the clients and the mission of adult and continuing education are changing and will continue to change as a result of demographic, economic, and technological shifts in the economy.

New Directions for Responding to a Changing Economy: Integrating Education and Work

Ivan Charner, Catherine A. Rolzinski

Continuing and postsecondary education strategies for the future will depend on the characteristics of tomorrow's learners as well as the nature of the changing economy. We can be fairly certain about the demographic composition and educational needs of the traditional college-age population of eighteen- to twenty-four-year-olds. We are less certain, however, about the makeup of adult learners of the future and about the effect that changes in the economy will have on educational policies, programs, and practices. One thing that seems certain is that we will need a better integration of education and work if our nation's productivity and economic viability are to improve and if the postsecondary education enterprise is to survive at its current levels. Whether in terms of formal partnerships between educational institutions and businesses or in terms of the preparation and retraining of human resources, education and work need to be more closely integrated. Nowhere is this more critical than in continuing education, whose mandate is to serve the needs of adult learners and, to an ever-increasing extent, the needs of business and industry.

I. Charner, C. A. Rolzinski (eds.). *Responding to the Educational Needs of Today's Workplace.*
New Directions for Continuing Education, no. 33. San Francisco: Jossey-Bass, Spring 1987.

We begin by tracing the structural changes facing the economy throughout the remainder of this century and well into the next. We then introduce a framework for examining the resources that comprise the adult and continuing education system, and we use this framework to explore new strategies for integrating education and work.

Structural Changes Through the Twentieth Century

Continuing education policies and practices are developed in response to a complex set of factors. As we move toward the twenty-first century, a number of these factors are changing: the population, for example, is aging; the information industry is becoming a dominant force in the economy; and technological advances are rapidly changing the employment picture.

Continuing educators can choose between two types of response to these changes. In the first, continuing education takes a reactive posture; new strategies are developed in direct response to changes that have already taken place. The second type of response is a more proactive one, in which continuing educators try to predict the changes—through research, analysis, and some luck—and develop new strategies in anticipation of the changes. Such an approach involves greater risks, but the payoffs in terms of preparing individuals and institutions for economic change should offset the risks. Because it is not always possible to predict change, continuing education by necessity will have to employ both types of responses simultaneously.

In this section, we present the major social and demographic, economic, and technological shifts predicted for the next quarter century, focusing on their consequences for the workplace and other institutions. New strategies and considerations for continuing education and for integrating education and work are presented later in the chapter.

Social and Demographic Shifts. The changes in the composition of the U.S. population and in the composition of its labor force have both direct and indirect consequences for adult and continuing education.

Aging of the Population. Since the baby boom of the 1940s and the 1950s, the U.S. population has been aging. The number of young adults (sixteen to twenty-four years old) will decline between 1980 and 1995, affecting the pool of traditional-age college entrants and the pool of entry-level workers in the labor force.

The 1980s and 1990s will see the baby-boom generation move into middle age, increasing the number of workers thirty to forty-nine years old by 79 percent. By the year 2000, the median age of the U.S. citizenry will be almost thirty-five. The labor market behaviors and attitudes of this cohort of workers will be affected by "generational crowding" or "midcareer compaction." That is, there will be far fewer of the job and career promotions usually associated with the midcareer stage than there will be middle-aged workers. One consequence of this phenomenon is that many in this cohort will need to make major career and life shifts, looking to other work and nonwork opportunities for their financial, social, and personal rewards.

Medical and nutritutional advances will continue to increase life expectancies. While many older workers will retire early, others will remain in or re-enter the labor force, for financial, social, and psychological reasons. New work patterns are expected that will enable these older workers to work part-time (daily, weekly, monthly, or yearly) while pursuing other activities traditionally associated with retirement. Services and resources for these older persons will be needed on a scale that will only be surpassed when the baby-boom generation moves into its older years in 2025.

More Women and Minorities in the Labor Force. The numbers and proportion of women in the paid labor force have been steadily growing. It is estimated that women will comprise 65 percent of all new hires during the next ten years and over half of the labor force before the end of the century. At the same time, the population of blacks and Hispanics in the U.S. work force will steadily increase. By the year 2000, these two groups will constitute almost one-quarter of the work force. Increased immigration (legal and illegal) is expected as a result of shortages of entry-level workers. The impact of the increased proportion of minorities also will be felt by schools, government, and service organizations.

Economic Shifts. Major economic shifts and corresponding changes in the employment sector have occurred over the past two decades, and further shifts are expected through the first quarter of the next century. Some of these shifts have been or will be dramatic, while others will be more gradual. What we produce, how we produce, the way we work, and the distribution of jobs are changing and will continue to change. While the speed of these changes has clear implications for continuing education policies and practices, it is the changes themselves that will have the major impact on the future of continuing education.

Decline of the Industrial Sector. In 1984, 30 percent of the work force was employed in the industrial sector. However, this sector has been declining since the early 1950s, and the decline is expected to continue through the next decade, due, in large part, to increased automation and robotization, improved operational procedures, and competition from developing countries with low labor costs. This sector is expected to employ only 11 to 12 percent of the work force by the mid 1990s. The automobile, steel, clothing, and support industries have been affected by the growing trend of importing, which has led to large numbers of displaced or dislocated industrial workers.

Growth of the Service Sector. The service sector is, by far, the dominant sector of employment with about two-thirds of the work force employed in service jobs in 1984. Over 80 percent of the employment growth projected through 1995 is expected to occur in the service sector. The growth of this sector is due to a number of factors: First, the growing proportion of women in the paid work force is increasing the number of dual-income households (75 percent by 1995). These households are "short" on time but "long" on money, and consequently they "buy" more time by purchasing more services, such as meals, home repair, dependent care, and education. In addition, there is an increase in the number of single-parent households, which may not be "long" on money but will need to purchase many services, nonetheless.

A second factor that will affect the growth of this sector will be the millions of workers displaced by automation, technological advances, and foreign competition. Since many service jobs involve relatively unsophisticated, commonplace skills and knowledge, the service sector has always been the natural employer of last resort. The ready supply of displaced workers with limited employable skills will lead to low wages in parts of the service sector and thus will promote the general growth of service-related business. Millions of people use low-level service employment as a transitional phase in their careers, while they acquire some form of retraining to qualify for work in higher-paying jobs in the service and other sectors of the economy.

Continued Growth in Self-Employment. Self-employment, which reached a low of 7 percent in 1970, has been on the rise since then and is expected to continue to grow. The growth of the service sector and of the information industry within all of the sectors, will reinforce this rise by encouraging independent information and service entrepreneurs. It is projected that self-employment will double by the year 2000 from its low point of 1970. As midlevel, midcareer workers are laid off or not promoted, they will be "forced" to become self-employed in new venture enterprises. Others will see the opportunities for self-realization, independence, and personal advancement in starting their own businesses. The computer software and support industries provide clear examples of this growing phenomenon.

Growth of International Trade and Third-World Development. Developed countries are rapidly using up their reserves of natural resources while continuing to upgrade the quality of human resources. This will cause increased dependence on developing nations for raw materials and "cheap" labor for mass-produced goods. It is projected that, by the year 2000, one-third of the world's goods and services will be consumed or used outside of the country of origin.

Technological Shifts. From microcomputers to robots, word processors, and genetic engineering, we have witnessed rapid advances in technology in the past two to three decades. These new applied technologies have affected every sector in the labor force and in the general society.

Agricultural advances have allowed fewer and fewer farmers to produce more and more. The microcomputer and word processor have transformed the office from one that is largely labor intensive to one that relies heavily on electronic storage and transmission of information, creating the "paperless office." Automation has transformed the assembly lines and factory floors in many industries by using robots to perform the tasks of large numbers of workers. Computer-aided design (CAD) and computer-aided manufacturing (CAM) have been used in a wide array of industries to design and produce new products and systems. Communication has also been affected by new technologies. Teleconferencing (video and audio), satellite systems, videotext, and car phones are just a few of the new communications technologies that have emerged in the past few years. The advances in biological and health sciences, as a result of technological change, are no less staggering.

The high-technology revolution is all around us—in the factory, at the office, in our communication, transportation, and health care systems, and in our homes. The growth of these technologies will continue, but the implications for employment, social relations, and personal development are yet to be recognized fully.

Creation and Elimination of Jobs. Robotization, CAD/CAM systems, and other new manufacturing and industrial technologies are projected to eliminate 5 to 7 million jobs (mostly blue collar) before the turn of the century. Information and communication technologies, on the other hand, are expected to eliminate 7 to 12 million white-collar positions. The total loss of jobs is projected to be between 15 and 20 million by the year 2000. At the same time, the production of these new technologies will create 2 to 3 million new jobs, while positions related to the maintenance and repair of these new technologies will generate an additional 4 to 5 million high-technology service positions. In addition, these new technologies will affect the production of finished information products (books, magazines, disks, cassettes, and video media) in their "publishing" industry. Between 1.5 and 2.5 million jobs are expected to be generated in this area. The net result is a loss of between 5 and 13 million jobs due to the new technologies.

Collaborative Approaches to Human Resources Management. While new applied technologies will affect the workplace, productivity will also be affected by the "social technologies" used to organize and coordinate human resources. Recent workplace research, which has been brought into sharp focus by comparisons with foreign competitors, suggests that more collaborative, decentralized workplace arrangements and human resource management technologies (such as quality circles, job enrichment, joint union/labor agreements, and so on) possess a far greater potential for increasing productive capacity than do purely technological innovations.

Collaborative approaches to human resources management are being pursued successfully at all levels of operation in private and public, large and small organizations. The potential impact of such collaborative approaches, however, is dependent on their acceptance by all levels of employees and by the wider society.

The structural changes that are anticipated for the next twenty-five years are sure to affect the work force, the workplace, the lives of workers, and society in general. The combined effects of the ongoing economic transition, the changing demography of the population and the work force, and the nation's assimilation of new applied technologies assure a steadily increasing demand for training, education, and human resource development. The critical question is not what the overall level of investment in education, training, and human service development should be, but rather, *how* continuing educators and trainers should respond to these changes.

Strategies for Integrating Education and Work

In this section, we will develop a framework for analyzing continuing education resources and for exploring new strategies and directions for integrating education and work.

The framework has four major elements, which are related to each other in a dynamic way. The four elements are clients, content, modes of delivery, and sources; these are the resources that comprise the continuing education system. The framework recognizes that the relations among the elements are affected by two sets of external factors: the changing economy, and the policies regulating education and training processes and economic behavior.

Clients. At the center of the continuing education system are the clients. Clients are the students and organizations who use education and training services. While adults are the most obvious client group, businesses, community groups, unions, and the government must also be considered clients of the system.

As the needs of different client groups change, so must continuing education offerings. For example, the changing demographics suggest new strategies related to preretirement education, retirement programs, basic adult literacy, and English-language programs, to name a few. The economic changes suggest, among others, programs in small-business development and international trade, while the technological changes will require retraining programs as well as programs on collaborative approaches to human resource management.

Whether preparing individuals to meet the challenges of a new job, a new career, or a new phase of life or helping businesses and other organizations respond to changing economic and technological factors, continuing education clearly must be based on strategies that integrate

education and work. By working with representatives of business, government, labor, and community organization on planning committees or teams, continuing educators can identify their future clients and take the lead in developing proactive education and training programs for them.

Content. The content of continuing education consists of the skills, knowledge, and attitudes directly and indirectly transmitted to clients. It also includes support services for individuals and organizations. Seven broad content categories include:

- General/liberal education
- Basic skills
- Vocational skills
- Skill retraining
- Skill upgrading
- Management and professional training
- Support services, such as:
    a. Counseling
    b. Information
    c. Basic and applied research
    d. Economic and community development.

Changes in economic, demographic, and technological conditions have affected and will continue to affect the content of continuing education programs. For some programs, these changes mean being more responsive to the needs of local businesses, while, for others, they result in new programs that focus on the individual adult learner and offer courses in basic skills and literacy, retraining, or skill upgrading.

The changing education needs of the workplace and the economy suggest a content for continuing education that is characterized by diversity. Continuing education must work with businesses and adult learners to anticipate the diverse needs of these diverse clients. A second strategy for identifying the content needs of the future is through the analysis of the economic development and human resource needs of a community. For example, if a community has a large population of factory workers approaching retirement, a concerted preretirement education program would be called for. If this same community is facing plant closings, programs that prepare people for new jobs in the service and information sectors or in new technologies would be needed. The point is to develop content for continuing education that not only responds to the immediate needs of its clients but also anticipates their future needs.

Modes of Delivery. Modes of delivery are the ways in which content is made available to clients. Modes of delivery comprise the methods, timing, and location of instruction as well as the means by which support services are delivered.

Methods of instruction can be formal, experiential, or informal. Formal instruction most often follows an explicit set of content guidelines and employs lecture, discussion, exercises, or experiments, and other classroom-based activities. The majority of continuing education instruction utilizes such formal approaches.

The experiential or experience-based method of instruction is growing in popularity, particularly among teachers of older learners and of adults engaged in skill training. In experiential learning, the learner engages in an activity or activities that are closely related to the desired instructional outcomes. Teaching follows a more implicit set of content guidelines. This type of instruction tends to be more practical, but it also often has a theoretical component. Using entrepreneurial skills as an example will help clarify the distinction between the formal and experiential methods of instruction.

The delivery of entrepreneurial skills can be accomplished through the use of textbooks, lectures, and discussions. In this case, an explicit curriculum is followed to teach the elements of successful small-business operation. An experiential approach would have learners participate in a small business (through an "incubator" program or a simulation, for example, or by apprenticing under a small-business mentor). In this situation, elements of small-business operation are learned through the actual experience of running a business; the content is transmitted implicitly. It should be noted that these two methods are not mutually exclusive, and many instructors combine the two.

By "informal methods of instruction," we mean opportunities outside of an educational program, through which individuals can acquire norms, values, information, knowledge, expectations, skills, and can learn roles. These opportunities most often occur because of membership in a group or because of interaction with an individual. Here, content is neither implicitly nor explicitly transmitted. Rather, through generalized others (Mead, 1934), reference groups (Hyman and Singer, 1968), role models (Merton, 1965), significant others (Sullivan, 1947), or symbolic models (Bandura, 1971), informal instruction and learning take place.

Timing and location of instruction are the other two components of modes of delivery. Timing relates to the "when" and "how long," while location relates to the "where" of instruction. Continuing education has been a pioneer in varying the patterns of timing and location to respond to the needs of different clients. To provide the integration of education and work for diverse clients of the future, educators will need to continue to offer instruction in workplaces, communities, union halls, over the radio and television, through computers, and in other nontraditional locations. In addition, planners will have to continue to offer programs of varying lengths (such as one-day seminars and workshops, weekend programs, and multisession courses) at varying times—namely, during the summer, weekends, early morning, evening, and so on.

In summary, it is essential for all strategies for integrating education

and work to vary their modes of delivery to respond to the needs of different clients. This means increasing the programs' reliance on experiential and informal methods of instruction and on the use of computers, radio, television, audio and video cassettes, and other new technologies. It also calls for continued diversity in terms of when, how long, and where programs are offered.

Sources. Sources are the institutions that transmit skills, knowledge, and attitudes to individuals. While the home (family), the community, and mass media are all sources of instruction, for the purposes of this framework we focus on education and training institutions and the workplace. We will identify here three specific types of such sources.

The first of these sources are the public and private institutions of higher education, including universities, two- and four-year colleges, and vocational and technical schools. These schools transmit information, knowledge, skills, and attitudes directly through the content of their programs and course offerings and indirectly through interactions with individuals and groups within the schools. To an increasing extent, especially with the growth of two-year colleges and continuing education, these institutions are serving diverse target populations, including adult workers, businesses, unions, and community groups.

The second source is the workplace, which is offering strong competition to the traditional institutions of higher education through a "shadow education" system. This system comprises corporate training offices and institutes. Corporate training offices offer formal and informal education and training programs to employees; these programs usually involve skill training or retraining, skill upgrading, management and professional training, and basic skills instruction. Training institutes also have been set up by large corporations to respond to specific needs for their work force. These institutes can operate within an organization or external to it as separate entities set up by the corporation.

The third source of continuing education and training are private skills training institutions and individuals. Associations, unions, consulting firms, service organizations, proprietary schools, and individual consultants can offer programs and services. Today, associations such as the American Banking Institute, the American Management Association, and private training organizations offer more programs and have more students than all traditional postsecondary education institutions combined. Service organizations, such as community service agencies and churches, offer a wide array of continuing education, training, and services. Through funds provided in collective bargaining agreements, cooperation with colleges and universities, and their own financial support, unions have created a variety of mechanisms to support the higher education of workers through financial subsidies and program delivery. Private proprietary schools offer training in specific skill areas such as secretarial science, beauty sciences, dental technology, drafting, computer programming, and business. Finally, the increase in the number of private consultants who offer training and other services to corporations, social groups, and individuals has been nothing short of phenomenal. From self-help to speed reading, from career or life planning to specific skills training, private consultants provide a wide range of continuing education and training programs.

The magnitude and diversity of these often competing sources of continuing education require new ways of combining education and work for the very survival of the traditional continuing education enterprise. Through partnerships with businesses, organized labor, government, and community groups, continuing education can carve out its territory for delivery of educational and training programs and services. Some overlap of programs among the different sources of continuing education is both necessary and inevitable; too much overlap, however, will benefit neither the sources nor the clients of continuing education programs.

Summary

The conceptual framework that has been developed presents a means of examining the resources that comprise the continuing education system and of exploring new strategies for integrating education and work. These new strategies must accommodate a number of common themes: First, the clients of continuing education are not only adult learners but also businesses, unions, community organizations, and government agencies. The needs and wants of all of these clients must be assessed in relation to the changes in demographic, economic, and technological conditions.

Second, new content and modes of delivery need to be developed that will be responsive to these diverse clients. Content must be learner or client driven; relevant to the life situations of the learners or to the nature and characteristics of the businesses, unions, or community groups; and responsive to local and national economic and demographic realities.

Third, methods, timing, and location of instruction have undergone dramatic changes. Methods that continue to experiment with experiential, self-directed, technology-assisted, and peer-led strategies will be needed. Also, new timing schemes that have no boundaries on when, how long, or where a program will be are essential.

Fourth, because the sources of continuing education include corporations, associations, other organizations, and individuals, traditional providers of continuing education will need to be more "businesslike" in their approach to marketing and more responsive to the needs of clients. By working with these other providers, problems of overlap and "turfdom" can be reduced.

Changes in continuing education resources will result in new directions for programs, and the development of partnerships with other institutions and organizations offers an effective approach to dealing with these changes. Through partnerships with businesses, unions, community groups, and government agencies, continuing educators will be able to offer educational programs and services that both respond to and anticipate changes occurring in society.

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An English-language program in the workplace is implemented, achieving the objectives of the employer, liberal education, and limited-English-proficient workers.

English-Language Training for the Workplace

Elizabeth F. Skinner, Nancy A. Siefer, Barbara A. Shovers

The workplace provides a rich source of information about language use in our society today. The accelerated pace of change, the increasing dependence on technology, and new styles of participatory management produce a work environment that is highly interactive. Success in all job positions, even at the entry level, now requires high levels of communication skills. New forms of language use are emerging to fit the demands of this language-oriented workplace.

An understanding of the dynamics of language in relation to work is valuable to educators because language competence remains one of the essential characteristics of the educated person in our culture. It is equally important to industry because it clarifies the nature of job proficiency in today's language-rich work settings. Future approaches to education and training, to be effective, must be based on such a practical understanding of communicative proficiency. This understanding requires the combined perspectives of education and industry.

Recently, Arizona State University (ASU) and Honeywell, Inc., collaborated on a project, Language Working, which investigated the nature of language use within one facility of Honeywell's Large Computer Prod-

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ucts Division. The information gained through this study was used to design an English-language training program for Honeywell employees who were limited in their ability to communicate on the job because their native language was not English.

In this chapter, we explore the way in which this project was able to generate insights about language and work that are vital both to liberal education and to education for work. Following a brief description of the project, we explore how natural and productive a partnership between education and industry can be when three essential prerequisites are met:

1. *Reciprocal benefits.* Both partners must anticipate and receive concrete benefit from the partnership. In addition, each must be cognizant of the benefits anticipated by the other and facilitate their attainment.

2. *Complementary skills and knowledge.* The partners must recognize their need for each other. Each must bring skills and knowledge not possessed by the other that are critical to the project's success.

3. *Effective working relationship.* The partners must establish a structure within which they can interact effectively. The structure must be flexible and dynamic in nature.

Project Profile

The Language Working project was designed to improve the employment situation of workers from linguistic minorities by helping these workers increase their ability to use English to communicate in the workplace. To achieve this goal, the project team carried out a needs assessment, designed a curriculum, and piloted a training program.

Needs Assessment. The first objective of the Language Working project was to observe and document the language skills needed by limited-English-proficient workers to function effectively in their job positions.

Fieldwork at the site lasted six months. The project staff interviewed managers, trainers, and first-line supervisors or "group leaders." Once accepted by these supervisory personnel, the staff visited the individual work areas and talked with limited-English-proficient (LEP) workers and their native English-speaking coworkers. Multiple perspectives were gained about the language skills needed to be an effective worker. At the same time, support for the project was growing at all levels.

The staff asked to see copies of the instruction manuals available for each type of job in manufacturing. In addition, any other written documents or forms required to carry out job procedures were collected. These materials revealed much about the nature of the job tasks as well as the literacy demands that the workers face each day. Our observations helped us to detail the types of interactions that occur among workers and to identify the nature of the communication skills involved in those interactions.

Without exception, English-language instructors who operate programs in the workplace complained of inadequate preparation and insufficient understanding of the workplace environment. We wanted to develop a process through which future programs could prepare instructors efficiently and effectively. Throughout the needs-assessment phase of the project, the staff paid attention to process as well as content.

Curriculum Development. The second objective of the project was to utilize the information gained through the needs assessment to develop materials for a language training program. The curriculum that resulted consisted of five modules, each one dealing with a type of workplace event in which communication skills were especially important. The modules were entitled "Training," "Handling Routine Problems," "Breaks," "Meetings," and "Job Advancement."

The syllabi for these modules are organized functionally. In other words, each module is structured around a number of key functions or purposes for language use. Any specific language skills, such as grammar or pronunciation, are embedded within this functional structure. For example, the module on breaks, which deals with informal social language, is organized around such functions as sharing personal information, joking, and expressing feelings.

This type of functional format, developed in Europe in the 1970s, is becoming increasingly popular in this country for teaching foreign languages and English as a second language. It is especially appropriate for work-related instruction because it ensures that the training will always be relevant. Potentially meaningless drill work is embued with meaning when used to support a focus on authentic purposes for communication in familiar workplace events. It guarantees that what is practiced in the classroom will be practiced immediately and reinforced during the rest of the workday.

Pilot Training Program. The modules were piloted in an eighteen-week program taught on site at Honeywell during work hours. Thirty-six students were enrolled in one of three classes based on their level of English-language proficiency. Class sessions lasted one and a half hours, were held twice a week, and included a range of activities from skill practice, discussion, and role play to simulations. The staff communicated periodically with the managers and first-line supervisors of the students to inform them of what was being taught in the class and to seek their views on the students' progress. In addition, a cross-cultural training session was held for these supervisors to help them learn how to communicate better with their limited-English-speaking employees.

Reciprocal Benefits

Industry Perspective. Because of the changes Honeywell was undergoing at the time when the Language Working partnership was being formed, they were very open to participation. Like most companies in the computer-related industries, Honeywell's Large Computer Products Division (LCPD) was "downsizing" and reconfiguring its work force. As a result, the company was well aware that its reduced work force would need to be highly and flexibly skilled. The rapid pace of change in the industry would call on the remaining employees to be continually retrained and cross-trained. At the same time, the company was undergoing a "culture change" by adopting an approach to participatory management. All employees would be expected to participate in work and quality involvement teams to carry out production, solve problems, and provide creative input to company policies. Honeywell needed flexible workers able to learn quickly, think critically, and communicate effectively.

The company recognized that not all employees, though technically skilled, had the communication skills needed to meet the challenges of this new work environment. This was especially true of the limited-English-proficient workers who spoke English as their second language. At Honeywell's LCPD, these workers were primarily Hispanic and Southeast Asian in background; most had been working for the company for at least six years. Because these LEP workers were highly skilled and loyal employees, the company wanted to make an investment in developing their communicative competence.

The Arizona State University staff anticipated that the company would expect to see concrete benefits from the project in terms of more productive workers, fewer product defects, and, ultimately, dollars saved. Supervisors found that they could indeed document the outcome of the project in these terms. They were able to provide the company with such reports of positive changes in worker productivity as the following: "This program has saved the company a lot of money. Bad communication is costly. There have been fewer mistakes since the course began. The program is well worth it," and "I think the class does save money for the company because of better communication. We get better feedback, improved worker productivity, and quality of work. The class has benefited our area. Workers are happier and more productive."

Supervisors were able to estimate how much money the program had saved the company by considering the savings in employee time. Increased communication skills meant less time was spent explaining procedures and handling problems. One supervisor, for example, reported that, for each of the four LEP workers in his area, he saved approximately one hour per week of the worker's time and one hour of his own time. Taking their hourly salaries into account, this time saving translated into a dollar saving of $84 a week or $4,000 a year for this one area.

Educator's Perspective. From an educator's perspective, the value of the Language Working project came from its potential to generate a knowledge base, not previously available, for work-related language instruction.

The ASU staff saw this possibility as exciting both theoretically and practically. An important characteristic of the fieldwork was that it emphasized the functional aspects of language learning. This emphasis was influenced by two perspectives: the pragmatic, which views language in terms of what it accomplishes in the world, and the sociolinguistic, which insists that language be seen within its social and cultural context. From both of these theoretical viewpoints, studies of language as it functions in the concrete, outcome-oriented world of work are especially significant.

Practically, the functional emphasis was motivated by a desire to make language instruction more relevant to the needs of learners. Discontent with traditional academic forms of language instruction has been increasing worldwide. Students are demanding instruction that can prepare them to use language skills in real-life settings, and, for most students, the workplace is the most important domain for language use.

The ASU staff wanted to make a practical and theoretical contribution to the field through the Language Working project. The Honeywell participants, realizing this, took the time to provide the detailed information ASU needed. They provided the facilities and resources required to do in-depth and holistic assessments of language learning needs. They allowed researchers to interact with employees and provided access to work areas for detailed observations. In addition, the company worked with the staff in preparing materials, including videotapes for presentations to professional organizations.

In short, both Honeywell and ASU benefited from the Language Working program. Honeywell viewed the program as developing an important aspect of work proficiency that resulted in more productive workers, lower product defect rates, and increased profits. The ASU staff viewed the program as an opportunity to explore an important area of need in language teaching and to develop an innovative curriculum to meet that need. These perspectives, though different, proved to be compatible and mutually supportive.

Complementary Skills and Knowledge

The ASU staff required continual help from their Honeywell partners. This was true for a number of reasons. As educators, the ASU team experienced a kind of culture shock in entering the world of industry. They needed insiders to serve as informants in order to help them enter what was for them a strange setting, to avoid breaking the rules of acceptable conduct, and to learn their way around. The environment was difficult to negotiate both physically (because the buildings were labyrinthian) and socially (because the organizational structure was complex and dynamic).

Further, although the ASU partners know much about curriculum organization and presentation, they could not make decisions on their own about the content of a language training program for Honeywell because they lacked knowledge about the nature of communication at Honeywell. They needed the expertise of "natives" in order to identify the purposes and situations for language use in that specific context.

Honeywell, while generally aware of the problems caused by lack of language proficiency on the part of some employees, did not have the knowledge or skills to define the problem and formulate an educational solution. They realized that their usual strategies for problem solving and that their standard approaches to skills training were not appropriate. On the other hand, previous attempts to rely totally on educators by sending LEP employees to general English-as-a-second-language courses had failed to produce improvements in communication skills on the job. The company realized that they needed to collaborate with educators if an effective instructional program was to be possible.

After six months of interaction between ASU researchers and Honeywell, a language training program was designed that was uniquely appropriate to the workplace in terms of both instructional approach and content. Five situations emerged as especially central to communication at Honeywell: training; handling routine problems on the job; social language at breaks; meetings; and job advancement. Within these situations, a variety of functions or purposes for language use were prominent, including, for example, establishing social contact, following instructions, indicating lack of understanding, seeking information, reporting problems, and understanding jokes.

These situations and purposes, which could not have been derived without the intensive interaction between educators and workers, provided the structure and fabric of an effective language training program. In addition, decisions about scheduling, student placement, and other aspects of the logistics of course delivery could be made based on a thorough understanding of the work context; this, in turn, allowed the program to be integrated effectively into the workers' week. Choices of instructional strategy and design of materials could be made with consideration for the characteristics of the workers and the forms of training and instruction that they were already experiencing.

Effective Working Relationship

Although the company's motivation to participate was high, the Language Working project could not have achieved its goals if an effective structure had not been established through which the ASU and Honeywell partners could interact. Despite enthusiasm about expected benefits and mutual respect, educators and employers are most likely to abandon partnerships of this type early on because of differences in customary approaches to work. The participants become frustrated, time and energy are wasted in unproductive effort, and misunderstandings become increasingly damaging.

To avoid such negative consequences, the structure of relationships between educators and the workplace must be flexible enough to survive the frequent changes that occur in the workplace. Such flexibility involves the ability to adjust quickly to changes in personnel. In a little more than two years, the Honeywell liaison person with ASU changed three times. In addition, many of the key members of the partnership changed their job positions and locations within the company several times when major staff reorganizations occurred. Each time such a "break" occurred in the partnership, quick action was required by both Honeywell and ASU to repair the damage and protect the working relationship.

Flexibility was also required in terms of the direction and scope of the project as information emerged about communication in the workplace that influenced decisions about who needed to be involved in the partnership. For example, as workers were identified with potential need for training in communication skills, new managers and supervisors had to become involved in the planning. As the importance of the job manuals became evident, the staff needed to interact with the planning engineers who produced them and the personnel responsible for revising them. On the other hand, some changes meant less involvement for some individuals who were originally quite centrally involved. As the company decreased its reliance on temporary workers, for instance, it became less important to involve those staff members responsible for temporary workers.

To maintain the necessary flexibility, the partnership must have a structure that is supported through multiple contacts. For the Language Working project, multiple contacts were established on both sides of the partnership. The first contact between ASU and Honeywell came through the Human Resources Division. The staff maintained this connection after a liaison person was assigned to them in the Training Division. The liaison made certain that several other trainers became well informed about the project. This meant that, even if the liaison was unavailable, problems could be handled immediately and opportunities would not be missed. On the other side, since the seven members of the ASU staff interacted very closely with each other on all aspects of the project, any member could represent the others in interaction with Honeywell if this became necessary. In most cases, Honeywell could get immediate attention from ASU when problems arose or communication was necessary.

In addition, meetings were held at Honeywell with middle managers and first-line supervisors so that information about the project was widely available. A number of these individuals showed special interest in what they heard and became key providers of information for the ASU staff throughout the project. Through these managers and supervisors, the project was able to extend its web of relationships horizontally to other supervisory staff and vertically to workers and to upper management.

Several months into the project, the ASU staff and its Honeywell liaison made a presentation to upper management and gained official endorsement. One member of the vice-president's staff was especially vocal in supporting the project. The ASU staff followed up on his expressed interest, and he became a key part of the partnership.

The complex net of connections between ASU and Honeywell provided continuing communication. The ASU staff could share frequent progress reports and receive reactions and suggestions from a cross section of employees. These employees, from their various perspectives within the company, could keep the staff informed about actual and potential changes in the workplace that might have an impact on the project. They could answer questions as they arose and help locate other information.

Supported through both formal and informal relationships, the Language Working partnership remained strong and highly visible. Because the company's support for the project was well known, the project had a legitimacy that made employees more willing to become involved and to provide access to information and observation. The visibility of the project meant that some individuals sought us out and volunteered their help. It was relatively easy to introduce new people to Language Working since most workers already shared a basic level of knowledge about the project.

Liberal Education for Work

By structuring a partnership that allowed input and direction from both education and industry, the Language Working project was able to achieve objectives associated with both the education for work familiar to industrial trainers and the liberal education familiar to university faculty. Although the contexts for learning associated with a training center and a college classroom at first appeared discrepant, the compatibility of their educational goals became apparent as the partners worked together on a specific instructional program. While abstract discussions may emphasize differences between vocational and academic education, applied work on a concrete learning situation revealed the commonality of the underlying skills required for success in both contexts.

The Language Working training program helped to develop the kind of worker that industry wants and liberal education promotes: an individual trained to communicate effectively, think critically, make decisions, and work as part of a team. The program emphasized the dynamic language skills required to cope with the changing nature of today's work environments. Worker-students learned strategies for adapting to change and for acquiring and imparting new knowledge.

Focusing on generic competencies necessary for creative work and independent learning, this context-specific, job-related program was consistent in goals with traditional liberal arts course work. The collaborative effort that went into developing the Language Working project refutes the current rhetoric decrying the increasing gap between education for work and liberal education. A single program can achieve the purposes of both if an effective partnership is first established.

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New technical skills and applications are integrated within existing occupational programs to provide industry with graduates or retrained employees in high technology.

Developing a Computer-Integrated Manufacturing Education Center

Victor Langer

Hard hit by foreign competition and factory automation, Milwaukee industries are working collaboratively with the Milwaukee Area Technical College (MATC) to develop the cadre of technicians they will need to compete effectively in a manufacturing environment dominated by computer-aided design (CAD) and the flexible manufacturing cell (FMC). CAD and FMC are only a part of computer-integrated manufacturing (CIM), which permits the industry to minimize inventory and automate the manufacturing process. CIM demands a highly skilled labor force to keep the entire system functioning.

The Milwaukee Area Technical College gathered data about regional manufacturers concerning their labor needs and the technological skills required of employees. The result is that MATC has developed close working relationships with area employers. The college not only trains recent high school graduates but also provides a substantial program of retraining for those laid off by old-line industries as well as those fortunate enough to hold jobs in growing firms. Much of the equipment being used in the school has been donated by the industrial partners, and the firms help define the technology and curriculum used in MATC's program.

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Finally, these firms evaluate the program and its graduates to make sure that the curriculum achieves the goals that have been set.

The program is designed around computer-based labs that simulate the operating environments in the industries in which the student will work. "Clearly, the people at MATC believe that the best way to teach people how to operate and maintain such systems is to put them in an environment much like they will be using later on and help them become proficient users of those systems. This sounds very much like Carnegie-Mellon's definition of computer literacy" (Tucker, 1983-84, p. 37).

The Need for the "Supertech"

A careful examination of scientific hardware and modern industrial processes reveals complex systems that may be composed of combinations of electrical, electronic, mechanical, pneumatic, hydraulic, thermal, and optical devices. The person who works with high-technology equipment and systems must have a broad technical background to deal effectively with a variety of technologies. The manufacturer's greatest need, then, is for the "supertech," who can install, operate, maintain, and repair systems that may incorporate combinations of electrical motors, digital circuits, mechanisms, hydraulic actuators, lenses, light sources, and transducers. Many of the systems are controlled by microcomputers and are part of huge computerized data bases that require operators skilled in information management, including documentation development, storage, retrieval, and decision making.

Persons with such interdisciplinary skills and knowledge do not just emerge. They must be prepared through well-designed programs that include the broad knowledge bases required to apply the needed interdisciplinary skills. These are the technicians that MATC prepares for industry.

A broad understanding of basic principles in the various functional areas of high technology guarantees that the technician has flexibility. Although jobs that are repetitive or hazardous probably will be performed in the future by industrial robots, this does not mean that the displaced worker will no longer be needed. The worker obviously knows more about the requirements and skills of that specific job than anyone else. Logically, then, the displaced worker may re-emerge as a "technical supervisor" of a crew of five or six industrial robots. Such workers can be promoted and upgraded if they are willing and able to retrain for the technical aspects of their new jobs. In the high-technology occupations, however, this means extensive retraining in broad technical principles and equipment. A six-week, "quick-fix" course on how a particular robot works is simply not sufficient to produce the technologically competent workers needed for America's future (Hull, 1982).

CIM Technology

The advantages of CIM technology must be examined in the context of the primary Milwaukee industrial base, which is that of durable-goods manufacturing. Specifically, Milwaukee is known for its high-quality, precision metal-working industry.

The need to automate became necessary for the survival of this industry, and thus, the need to train and retrain a work force in the science of automation and machining has become an imperative at MATC. CIM technology integrates business, engineering, and manufacturing functions and requires numerous occupational categories to support automation. The relationship of functions within the automated factory is shown in Figure 1.

Project Profile

In the Milwaukee area, the Society of Manufacturing Engineers (SME) encouraged MATC to develop automation training programs as the result of its forecast for the future of flexible manufacturing systems. In this forecast, SME has predicted that, by 1990, 50 percent of all process plants will be computer controlled.

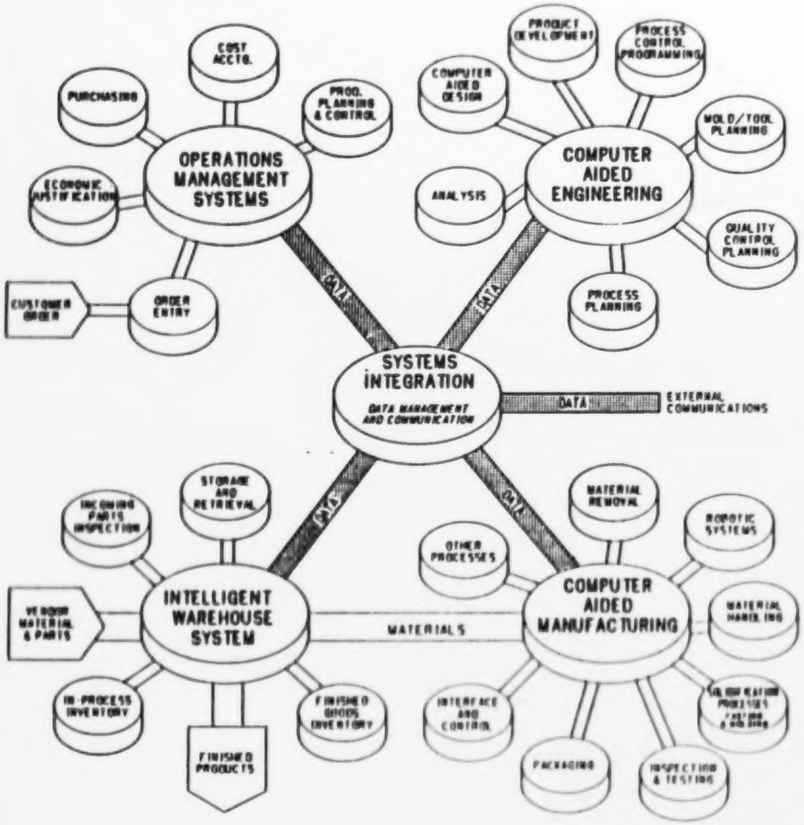
In response, MATC developed the CIM project to integrate new technical skills and technological applications with existing occupational programs. For example, drafters now learn how to be CAD operators, and welders are taught robot programming skills.

The overall goal of the project is to provide industry with graduates and retrained employees who can embark on high-technology careers in computer-integrated manufacturing and information management, as well as to disseminate software and courseware through established networks. The specific objectives of the project design were to provide cost-effective solutions to high-technology education. Industrial partnerships, an open resource center for maximum scheduling of expensive student stations, microcomputers, emulation of costly industrial systems, and course work all contribute to the efficient use of the program's resources.

The project, supported by a three-year grant from the Fund for the Improvement of Postsecondary Education (FIPSE), is now accomplishing its overall goal. A brief look at how this success unfolded may be helpful for educational institutions trying to serve similar clients.

In the first year, the project staff emphasized the research of competencies and jobs needed in the computer-integrated manufacturing areas. The result was the establishment of a new curriculum entitled "Computerized Machining"; its purpose was to teach the managing, operating, and programming of automated machinery. The new curriculum required the renovation of the Electromechanical Program; this program was retitled

Figure 1. Computer-Integrated Manufacturing Relationships


COST ACCTG.
PURCHASING
PROD. PLANNING & CONTROL
OPERATIONS MANAGEMENT SYSTEMS
ECONOMIC JUSTIFICATION
CUSTOMER ORDER
ORDER ENTRY
PRODUCT DEVELOPMENT
PROCESS CONTROL PROGRAMMING
COMPUTER AIDED DESIGN
MOLD/TOOL PLANNING
COMPUTER AIDED ENGINEERING
ANALYSIS
QUALITY CONTROL PLANNING
PROCESS PLANNING
DATA
DATA
SYSTEMS INTEGRATION
DATA MANAGEMENT AND COMMUNICATION
DATA
EXTERNAL COMMUNICATIONS
DATA
DATA
STORAGE AND RETRIEVAL
INCOMING PARTS INSPECTION
MATERIAL REMOVAL
ROBOTIC SYSTEMS
OTHER PROCESSES
VENDOR MATERIAL & PARTS
INTELLIGENT WAREHOUSE SYSTEM
MATERIALS
COMPUTER AIDED MANUFACTURING
MATERIAL HANDLING
IN-PROCESS INVENTORY
FINISHED GOODS INVENTORY
INTERFACE AND CONTROL
FINISHED PRODUCTS
PACKAGING
INSPECTION & TESTING

Source: James, 1985.

"Automated Manufacturing Technology," and it satisfies the training needs for installation and repair technicians of automated systems. In addition, industrial engineering, manufacturing engineering, and related industrial programs had to be altered and upgraded to meet the stringent requirements for those pursuing careers in CIM.

During the second year of the project, student groups completed first-year courses of the new and renovated programs. In the third year, the second-year students completed courses developed during the summer and the academic year.

To accommodate a complete flexible manufacturing cell, MATC undertook a major remodeling project, which called for the installation of $1.5 million in new machinery. This included the addition of two miniature automated manufacturing labs (AMLs). The mini-AML cells permit the teaching of concepts prior to the use of high-cost industrial systems. The minicells operate and use the same commands as the industrial FMC.

Partnerships were established with eleven corporations that agreed to help equip the FMC facility. These firms also volunteered technical support for developing both curriculum and facilities.

Course materials and personal-computer CAD/CAM software have been developed and are being refined for dissemination. A pilot national satellite television conference, "CAD/CAM: Are You Ready?," was broadcast on March 15, 1985, to sixty-seven sites and 2,500 participants. This broadcast involved MATC's Public Broadcasting Service (PBS) channels 10 and 36, the National Computer Graphics Association, and Sandia National Laboratories.

MATC's CIM project ended the development phase in December 1986. The first students have graduated and in the Spring 1986 semester, there were 207 students enrolled in the four primary programs under the project's auspices.

Perspectives on Project Success

CIM Technology Leadership at MATC. To a degree, MATC may be in advance of local industry, which has not generally installed CIM or cellular manufacturing. This is not unexpected, since MATC developed a model facility and curriculum in order to provide industry with a resource for technical guidance and retraining of the work force. The staff at MATC faced the same problems that industry faces in attempting to upgrade, including employee resistance to change, staff training, incompatible hardware and software, the high cost of installation and of staff, and especially the rapid turnover of staff.

Top-Level Support. The numerous and timely decisions necessary for the project's success demanded top administrative support. MATC's dean of the Technical and Industrial Division as well as the executive dean, chief executive officer, and the board of directors were all committed to providing the support and flexibility required by the project. The top-level assistance was needed to overcome the confusion of the bureaucratic maze, state contract laws, the budget process, and to meet important timetables and negotiate industrial partnerships. In addition, the commitment and support of the project team, comprised of industry consultants and MATC faculty and staff, was critical to meeting the rigorous timetable.

The Steering Committee. A steering committee was appointed to guide development of the project. Committee members included leaders in automation who represented the industries to be served by graduates and retrained employees. Representatives of labor unions, professional associations, high schools, and universities also served on the committee.

Significant factors in the project's success were the use of community leaders and the infrastructure of the committee itself. The committee was organized to establish subcommittees with the ability to add new members who had technical knowledge to contribute. The first subcommittees were to assess skill requirements in the following areas: (1) industrial engineering and manufacturing engineering, (2) automated manufacturing, (3) computer science, (4) computerized machining, and (5) welding technology.

The subcommittee chairpersons met as an overall curriculum committee that recommended and prioritized the needed areas of development for MATC. The curriculum committee presented the final report of recommendations to the steering committee at the end of the first year of the project. Priorities were also established for the second- and third-year activities that would implement the curricular changes.

Two additional subcommittees were established: procurement, to guide acquisitions of hardware and software, and industrial retraining, to guide employee retraining courses and programs within MATC.

The intense involvement of steering committee members with MATC staff created very positive working relationships, with the result that many of the companies donated technical support as well as hardware and software throughout the project.

Faculty Training and Selection. Faculty were given the opportunity to improve their skills in computers and automation techniques through workshops and courses taught by industrial adjunct faculty and by external consultants. Some MATC faculty attending vendor workshops returned to teach other faculty these newly learned techniques. Faculty selected to become involved in the project were in high-priority areas, had voluntarily obtained CAD training, had successfully developed curriculum materials, and had active industrial relationships.

Technology Leadership from Industry. One of the problems in establishing a program such as MATC's CIM is that the technology is so new and so much in demand that those most knowledgeable in the field are often pirated by others. MATC's solution to this problem was to reinforce its partnerships with industry. After the first year, MATC solicited technical support from leading local automation companies. Rexnord Industrial Automation Systems stepped forward to offer a project engineer on a half-time basis to coordinate the facility and curriculum. The FIPSE project provided the MATC salary match to Rexnord for the sixteen-month project engineer partnership.

The project engineer's first task was to review the facility requirements and redefine the cell specifications. The cell was defined as "world class" since it involved numerous vendor products and was thus typical of the manufacturing world. (A turnkey FMC operation available from some vendors with all the same controls and same-vendor products was ruled out in favor of this composite system.)

The second step was to negotiate with the different industrial vendors for partnerships providing both technical support and products. Several technical issues required the involvement of corporate vendor research offices in order to provide customized products. Rexnord became the prime contractor for developing the cell interface. Allen-Bradley donated a machine controller and the central programmable controller; ASEA donated a robot; CIMLINC donated a CIM workstation; Computervision donated software; Numeridex donated a graphic control system; Square D donated a programmable controller; and PREP, Inc., and Technovate, Inc., provided support in developing the minicells. Kearney-Trecker, Bridgeport, Enerpac, and Digital Equipment Corporation provided heavy discounts in equipment and software as well as technical support in application engineering and training. To date, over $2.2 million has been provided to MATC by its industrial partners.

Raising Performance Standards of MATC Graduates. On the advice of its curriculum committee, MATC adopted eight recommendations aimed at strengthening its CIM program:

1. Prerequisite compentency testing will be required for all entering students.

2. Students deficient in entrance skills are to be channeled into a pretechnical program.

3. The entrance mathematics requirement will be raised to the equivalent of Tech Math 1, permitting students in automated manufacturing to start in Tech Math 2 and also to complete a calculus course.

4. The new applied physics course will cover principles of physics, including the application of calculus.

5. MATC will strive to strengthen ties with industry by having faculty attend vendor training courses, by arranging student tours and student internships, by promoting joint development of CIM materials and software, and by inviting industry guest lecturers.

6. MATC will actively seek Accreditation Board for Engineering Technology (ABET) approval for its curriculum.

7. MATC will offer a common technical graphics course including

CAD, a common "Computer Programming for Technicians" course, and the applied physics courses.

8. A concept will be developed that integrates the economics of automation within the industrial automation course.

In addition, the "Computer Programming for Technicians" course is to be taught by mathematics faculty rather than electronics faculty. The industry representatives also recommended the addition of a technical writing course as a third semester of English. The curriculum committee wanted the program to prepare graduates with broad enough competencies so that they could be sent to vendor schools and have a high probability of success. The educational outcomes needed to succeed as an automated manufacturing technician were the ability to think effectively, to communicate, to judge, and to discriminate.

If the level of entering students is controlled and the level of instruction improved, then the quality of graduates will be improved. Thus, more jobs will be available to graduates. Students aggressively seek out successful career paths and usually find out where to go to get a quality education with a good chance of getting a good job. Therefore, even with raised entrance standards, more students will want to enroll because of job opportunities. This especially holds true for minorities (Langer, 1984).

Industrial Retraining and Continuing Education. With the development phase completed, the CIM project is now part of the MATC curriculum. Today, MATC offers 143 occupational programs to the community. Many students are employed full time and take programs on a continuing education basis.

Employees being retrained fall into three general categories:

1. Some are technicians or skilled workers learning application of new technology to current occupations, such as drafters or designers acquiring CAD skills or welders acquiring robotic programming skills.

2. Others are technicians or skilled workers preparing for new technician or skilled-worker occupations, such as a welder enrolled in the basic electronics program.

3. Others are unskilled workers seeking basic skills training, in areas such as shop math, metrology, and blueprint reading, as preparation for entering skilled areas.

Through traditional continuing education delivery mechanisms, including on-site contract training, MATC is helping facilitate the modernization of the local manufacturing and engineering industries (Langer, 1986). Strategies are being developed to arrange blocks of time for industrial retraining; these blocks of time would consist of two-hour lectures and two-hour hands-on experience sessions. In highly technical programs, specialized courses are occasionally offered late in the day or in the evening, with a client mix of full-time students and full-time employees. Often, advanced courses have only a few students, and the addition of worker retraining students can fill the section. When the worker shares his or her on-the-job experience in class, it helps prepare the full-time student for employment and provides an additional benefit.

Cost-Effective Delivery of High-Cost Workstations. MATC developed a CAD software package called MATC CAD to operate similarly to Computervision's industrial CAD system. MATC CAD currently is in use by more than 700 educational institutions. The initial cost of $100,000 per industrial workstation was reduced to less than $1,500 per MATC CAD personal computer (PC) based workstation including hardware and software. This very significant reduction makes CAD education affordable and practical.

Of particular benefit to educational systems that cannot afford the multimillion-dollar CIM cell, the same concepts may be presented through use of miniature low-cost tabletop components. A complete automated manufacturing lab consisting of mills, lathe, robots, conveyor, foundry, inspection, and cell computers using industrial commands is now packaged for tabletop use to cut wax or to cut metal at a fraction of the industrial cell cost of $1.5 million. The automation concepts can be taught in less space, for less capital investment, and less maintenance cost on the minicell.

Quality Elements for Integrating Education and Work

In summary, the key components, approaches, and practices essential for educational institutions to develop a quality high-technology program include:

1. *Faculty and staff:*
   - Lead faculty should have advanced degrees, occupational experience, additional specialized training, successful publication or leadership skills, and commitment to succeed.
   - Faculty assignments should be about half research and development and half teaching.
   - Technical support staff is needed to enhance faculty expertise and to maintain operations.
2. *Facilities and equipment:*
   - Facilities should be located in the "industrial base" of the program.
   - Facilities and equipment must reflect state-of-the-art industrial installations.
   - The vendors should provide continuous support in hardware, software, and application engineering (not necessarily without cost to institution).
3. *Curriculum and instruction:*
   - Technology should be integrated into the program as a "tool."
   - Concepts are stressed, rather than the language of technology.
   - Problem solving is stressed.

- Successful industrial retraining requires a mix of full-time students and experienced employees who are working to upgrade or advance their present skills.

4. *Business/industry cooperation:*
   - Curriculum and procurement must be guided by a steering committee of industry representatives.
   - The project engineer should be a key industry executive who can devote at least 50 percent of his or her time to college activities and 50 percent to industry activities.
   - Donation of resources including development activities are essential to the creation of a world-class center.
   - Faculty should be employed during the summer for four to ten weeks so that the members may gain relevant occupational experiences in an industrial setting.
5. *Budget, resources, and support:*
   - Funds from grants enable the hiring of a technical "guru."
   - Products developed having a market potential may be revenue generators as an entrepreneurial activity.
   - Grants inspire a commitment to goals within a time frame normally not possible.
   - Top-level administrative support is mandatory in order to maintain a commitment to aggressive goals.
6. *Student recruitment, selection, and support:*
   - Linkages with industries and high schools provide students who are prepared and, in many cases, who may be enrolled with advanced standing.
   - Prerequisites must be clear, and testing to qualify potentially successful candidates may be necessary. In some cases, candidates may be placed on a remedial track to help ensure success.
   - The products should be disseminated to high schools. This will aid in attracting academically superior and motivated students.

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Comprehensive education services are adapted to the realities of emerging growth companies in a corporate park.

The Business Development and Training Center: An Educational Maintenance Organization

Lois Lamdin, Maxine Ballen Hassan

Today the Business Development and Training Center (BDTC) runs an education and training center in the largest corporate park in the East, provides a variety of academic and career counseling services, coordinates such disparate activities as a consultant file, the Career Connections Job Service, and numerous special-interest groups, and publishes a newspaper with a circulation of 12,000.

How did it start? What are the critical elements of the educational maintenance idea, and how does it become a reality? This case study provides the answers to these questions and explores what was learned about integrating education and work in the process of developing a new approach to education and human resource development.

The BDTC was a joint project of the Compact for Lifelong Educational Opportunities (CLEO) and the Great Valley Corporate Center in Malvern, Pennsylvania. The corporate center was developed by Rouse & Associates to be the "workplace of the future"; CLEO, on the other hand, was a consortium of postsecondary institutions in southeastern Pennsylva-

I. Charner, C. A. Rolzinski (eds.). *Responding to the Educational Needs of Today's Workplace.*
New Directions for Continuing Education, no. 33. San Francisco: Jossey-Bass, Spring 1987.

nia, which was created in order to attract and provide services for the new adult learner. CLEO's initial objectives were to:

- Attract adult learners back to further schooling through the use of print media, public service announcements on radio and television, and public information sessions in various sites around Philadelphia and the adjoining four counties
- Provide academic and career counseling, "hotline" information on courses and programs available in member institutions, and assessment of prior learning
- Provide faculty and staff development activities to support the kinds of change needed if adults were to be well served by higher education.

Built on the philosophy of the health maintenance organization, the educational maintenance organization (EMO) was initially conceived as creating an overall system of educational services and accountability to be shared by employers, unions, educational organizations, and individuals.

Taking the EMO idea as its basis, CLEO proposed to develop a model with the following distinguishing factors:

- On-going, on-site provision of a variety of training, counseling, and other services as needs arose
- Mutual commitment of educators and employers to supporting a multifaceted human resources program
- A financing structure in which corporations would prepay for services.

It was envisioned that, by contracting with CLEO, a company would have access to the teaching, research, and consultation capacity of thirty-four major colleges and universities, and they could thus shift some of the burden of human resource management and training to the educational maintenance organization. In this way, the colleges would gain the recognition and experience needed to reclaim their role as primary providers of educational services to the business world, and the learners would gain access to learning resources appropriate to achieving their personal and career goals.

The proposal to develop an EMO was financed by the Fund for the Improvement of Postsecondary Education (FIPSE). Today's Business Development and Training Center at Great Valley Corporate Center, while it adheres to the underlying principles of the EMO, bears only a superficial resemblance to the creature initially envisioned by those who wrote the FIPSE proposal.

The Business Development and Training Center

In the midst of Great Valley Corporate Center, where stunning contemporary buildings sprawl among the rolling hills of Chester County, Rouse & Associates have preserved a late-eighteenth-century farmhouse. The first floor of the farmhouse has been renovated for the BDTC's use with an interesting mixture of colonial charm and twentieth-century functionalism. One fairly large space was turned into a classroom that can hold thirty-five to forty people. A conference room with a table seating ten to twelve remains a conference room, but, with extra chairs, it can seat up to twenty for a small class or workshop. Some open office space and a small room in the basement that can be used by part-time staff complete the BDTC headquarters.

Great Valley Corporate Center is marketed as the "workplace of the future," a high-tech park that serves as the hub of the emerging high-tech Route 202 corridor. The marketing hype has in fact created a reality, and there are now a large number of young, entrepreneurial companies in the center, creating a stimulating but volatile environment.

The average size of the companies in the center is very small. Of the 181 companies present in the spring of 1986 (that number has increased since), 140 had twenty or fewer employees, while only two companies had more than 250 employees. The center consists largely of high-tech and information services companies, with only 29 percent of the total in such traditional fields as sales and distribution, utilities, and light manufacturing. Sixty-two percent of the employees in the center are in the high-tech or biomedical/chemical/pharmaceutical and computer areas, and only 18 percent are in sales, distribution, and utilities.

On-Site MBA Program. By the spring of 1984, the BDTC had identified a core group of about thirty-five men and women who wanted to pursue a graduate degree in business but who were reluctant to enroll in an MBA program that would mean traveling into the city, fighting traffic and parking problems. They were eager to have an on-site program developed and were willing to help.

The first step was to invite the deans of the business schools of the major universities to meet with these potential students. Of the nine invitees, the deans of five schools attended. A second meeting with the potential students and the deans of the three most interested participating universities was followed by a period during which programs, faculty, tuition costs, and general attitudes were compared. Finally it was decided to invite St. Joseph's University to bring in its program. At every step of the way, the BDTC worked with and deferred to the judgment of the potential students, which not only made them feel more invested in the program but also saved the BDTC from charges of favoritism by the universities.

St. Joseph's University seized the opportunity to extend its reach into the corporate world. The university had already established two satellite campuses within a reasonable distance of Great Valley and was able to schedule classes in such a way that a student could be reasonably assured of being able to take most of the required courses without having to go to the city campus. St. Joseph's made arrangements with its bookstore for textbooks to be brought to the BDTC at the beginning of each semester.

The program's success has amply justified St. Joseph's leap of faith. There seems to be a steady stream of new and continuing degree candidates. There are enough students to justify two very well-filled courses per semester, for three semesters per year. The students are pleased with the quality of the program and the responsiveness of both faculty and administrators, and St. Joseph's reputation in the business community has received a substantial boost. The program has enhanced the BDTC's ability to meet the needs of the people in the Great Valley area and has raised its profile in the corporate world.

Other Courses, Workshops, and Seminars. After an agonizingly slow first six months, the BDTC's training and education programs began to take off. Initial problems were probably inevitable given its newness on the scene. Because of budgetary constraints, public relations efforts were inadequate, and, even among those who had heard of it, the BDTC was viewed as an unknown quantity with an imperfectly understood mission. Nearly two-thirds of the scheduled courses in those first six months had to be cancelled. Registrations gradually improved in the spring and summer of 1984, and by the fall the BDTC had fairly respectable registration numbers.

Although most of the education and training is currently occurring on the premises of the BDTC, custom-designed training is clearly an important part of its future. It has been asked to coordinate several programs, and the number of requests are increasing as the BDTC becomes better known. One such program put together for General Electric (GE) is a good example of the kinds of company-specific needs that custom-designed training can fulfill.

Within Great Valley Corporate Center, there is a relatively small branch of GE specializing in the design and manufacture of control mechanisms for electrical power systems. The company was experiencing problems with quality control, which they suspected had to do with the older workers on the line who were untrained in the newer electronics. However, they were forbidden by their union contract to test the workers to determine their skill levels.

The BDTC brought in Delaware County Community College, which designed a forty-two-week program in the newer electronics. Because the college, not the company, was in charge of it, testing was allowed, and ultimately twenty-two GE employees participated in the program. At the end of the course, when they learned that they could receive twelve to eighteen credits through assessment, eight of these employees, all men over fifty, decided to go back to school.

This proved to a win-win situation all around. GE had solved its quality control problem, the college had produced a program that enhanced its reputation and was financially rewarding, the BDTC gained credibility as a resource for setting up training programs, and the employees had both retained their jobs and increased their skills.

Early in the BDTC's first year, staff became aware of employees' need to meet people in other companies who shared their professional concerns. As part of its first steps toward assuming responsibility for activities beyond education and training, the BDTC supported the formation of special-interest groups, setting up the meetings, publicizing them, serving refreshments, and staffing them until they could stand on their own. Among the groups supported were:

1. Toastmasters—Many of the people in the park were finding that, as they assumed more responsibility in their companies, they were frequently asked to speak and felt unsure of their abilities. Toastmasters was one of the first groups to form and has been one of the most enduring.
2. Human Resources Managers—Although the smaller companies in the park typically don't have anyone who is formally charged with responsibility for human resources, there was a group of managers from the larger companies who felt a need to share with their peers. The human resource group meets about four times per year, sometimes to discuss a specific issue, sometimes to hear an outside speaker.
3. High-Technology Group—This group has subsequently been incorporated as the Pennsylvania Innovation Network (PIN), part of a national network, and continues to grow and expand its agenda.
4. Secretaries and Administrative Assistants Advisory Group—This is a group that functions as a support mechanism for its members and for the BDTC as well. The members of this group give valuable feedback on the needs and interests of this very important segment of the corporate population.
5. Investment Club—This group is affiliated with the National Association of Investment Clubs and is composed of people from many levels of corporate life who wish to learn how to invest in stocks more wisely.
6. Executive Roundtable—This group, comprised of chief executive officers, meets monthly to share issues, resources, and information. Topics discussed range from venture capital, to the impact of the new tax reform bill on business, to sales and marketing issues.
7. Business After Hours—This is less a group than a function. The BDTC arranges for one company per month to host a reception at which people can meet and business cards can be exchanged. The receptions are well attended and very popular.
8. Technical Managers Group—Formed at the request of a middle manager in a software company, the group has worked with a consultant who leads discussions on issues of common concern.

9. **Sales and Marketing Group**—This group meets for breakfast once a month, at which time one of the members presents his or her marketing strategies for criticism by the others.

Career and Academic Counseling. A key theme in the EMO concept is support for the individual's self-directed learning. Using the career and academic counseling resources of CLEO, the BDTC has brought a complete array of adult-learner support services to Great Valley employees. In the first two years of the BDTC, over 500 persons either received individual counseling, used the DISCOVER computer-assisted career counseling program, went through the program designed to assess prior learning, or took College-Level Examination Program (CLEP) tests at the farmhouse.

The following chart of BDTC activities provides a summary of services provided in years one and two:

	Year 1	*Year 2*
Number of participants in BDTC-sponsored programs	599	1,323
Number of credits earned in MBA program	0	294
Number of persons receiving academic or career counseling and testing	207	315
Number of referrals to colleges and universities	59	84
Number of consultant referrals	12	47
Number of miscellaneous services to business	63	750

***The* Great Valley News.** In September 1984, the BDTC began publishing a monthly newspaper, printing 12,000 copies of over forty pages with more than twenty pages of ads and distributing it all along the Route 202 corridor.

The reason for the success of the *Great Valley News* is related to the reasons why BDTC's program has been moving toward business services that provide linkages.

The workplace is replacing the neighborhood, the church, and maybe even the golf course as the "community" for many people. But this community can be fragmented, uncaring, or even hostile. The much overused and abused word "networking" becomes increasingly important as traditional ties of family and friends grow more fragile. People in the business community need to be able to share experiences, resources, ideas, and strategies. The *Great Valley News* has helped form a community in which these things can happen. Readers learn what is going on in the new company that moved into the building across the way; they see pictures of themselves and their colleagues at a meeting; they learn about the softball league schedule and the MIT Enterprise Forum and the hotshot management consultant who might help them with their production problem. They find out about opportunities to meet their counterparts in special-interest groups, and they learn where are the best places in the neighborhood to get a good lunch.

Increased Private Sector Involvement

In September 1984, a shift occurred from the college-driven agenda for the BDTC to one that would be more responsive to the needs of the tenant companies in the corporate center. This shift had relatively little to do with the fact that the BDTC was largely supported by Rouse & Associates. Instead, the shift evolved from a growing awareness of how the original mission could be modified to respond to new needs and new opportunities.

Given the genesis of the BDTC under the aegis of the Compact for Lifelong Educational Opportunities, it was perhaps natural to have assumed that the colleges and universities would be the sole purveyors of training and education at the BDTC. However, quite early on it became clear that the business sector itself was replete with expertise of all kinds that the experts themselves were willing and even eager to share.

The first real understanding of the important role that the private sector could play came when a group representing two major and highly respected legal and accounting firms and a large bank approached the BDTC directors with the suggestion that they put together an executive seminar series. Clearly it was in their interest to do so. The small companies in the corporate park represent potentially important future clients, and they could establish an early relationship with them through presenting the seminars.

The executive seminars became the BDTC's most notable success. The firms organized them around current issues about which they had firsthand information: copyright laws and software; how to cope with new tax regulations; going public; 401-K pension plans; and so on. They were scheduled for 5:00 to 6:30 in the afternoon once a month, wine and cheese were served, and the atmosphere was relaxed and collegial. The BDTC gained valuable visibility, a reputation for quality programming, and a modest profit as well. Clearly the colleges had strong competition.

The business community has been supportive of the BDTC in other important ways. A group of young business people who wanted to bring the MIT Enterprise Forum to the Delaware Valley asked it to staff and coordinate the project as well as take care of the mailings and registration. There are ten meetings per year, and the BDTC is reimbursed for services plus a generous amount for administrative overhead.

The president of a software company has offered to help develop a program to support the BDTC recruiting venture, Career Connections, and will lend the hardware on which to run it. The president of an energy company has given free warehouse space for the *Great Valley News;* the Rouse organization has helped with public relations; and everyone wants to give free advice.

Lessons Learned

The two and a half years of planning, development, and operation of the BDTC have been an exciting and frequently frustrating time, but certainly they have been a time of learning. This new educational services model, created in the high-minded naïveté of the academic world, has had to make a myriad of adjustments to the reality of corporate America. Among the lessons learned are these:

1. There is no question that the need for training and retraining in this transitional economy is enormous, perhaps exceeding the capacity of educational institutions to respond fully. However, in most small and many medium-sized companies, managers do not perceive that need, are paying it little attention, or simply cannot afford to do anything about it. It is in the larger companies that most training takes place or is supported by means of tuition reimbursement. Unless some way is found to aggregate the needs and resources of the smaller companies (through a BTDC or a chamber of commerce or some other cooperative model), this situation is unlikely to change.
2. There is less support for training for blue-collar workers unless such support is written into union contracts. The assumption seems to be that blue-collar workers are not (and should not be) upwardly mobile. In fact, the pressures of high-tech manufacturing and production techniques fall heavily on the blue-collar workers, and it is the blue-collar jobs that are most in jeopardy as we go through this transition to an information and service economy.
3. There is a demand for noncredit on-site courses, workshops, and seminars to which many colleges have been slow to respond. The demand is frequently not for off-the-shelf offerings but for a course tailored to meet a specific need. And when a company is experiencing a need, it does not want something promised six months later, after the curriculum committee has met and the academic dean has approved it and when the faculty person has a lighter schedule; it wants the need met now.
4. There is in the business world much skepticism about what colleges have to offer. They have a stereotype (sometimes accurate) about courses that are out of touch with the realities of the contemporary business world, taught by faculty who treat adult students as though they were nineteen years old and wet behind the ears. They see much that is irrelevant, dated, and impractical in the content and much that is a waste of time in the process. This set of perceptions is hard to overcome and means that much time must be spent by the educators in building credibility.

Implications for Integrating Postsecondary Education and Work

1. Any postsecondary institution interested in doing business with business should first look to its mission and its resources to determine if this is really a priority and if it has the appropriate programs, faculty, and administration necessary for its success.
2. Colleges should choose only their *best* faculty to teach off site and should make certain that they *want* to do it. Unwilling faculty make terrible teachers. Adult learners tend to be fair but highly critical. They recognize and will not stand for poorly prepared or out-of-date material, or for a condescending or inept pedagogical style.
3. Colleges must be prepared to be reasonably flexible when modifications of content or delivery are requested.
4. Colleges should be candid about what they cannot do. They should not take on contracts that will stretch their staff resources, compromise their academic integrity, or cause more dissension on campus than they are worth.
5. Colleges should look beyond course delivery to see what other resources they have to offer. A few colleges have begun to offer on-site career counseling or prior-learning assessment workshops. Others have done well with "Returning to Learning" seminars or simply by putting an academic counselor into an industrial plant a few days every year. An institution's relationship with the business community should not be just a series of courses. The institution should be thinking beyond courses to cooperative research projects, faculty-executive exchanges, internships, or consulting arrangements.

Relationships between the postsecondary education and business communities are a two-way street. Business does not have all of the money; colleges do not have all of the expertise. Both sectors are looking for rewards. They must work out win-win situations in order to build the foundation for true partnerships that are ongoing and mutually supportive. The EMO concept and its application through the BDTC show that education and work can be integrated to the benefit of all.

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"Economic literacy" curricula are designed for rank-and-file union members to enhance industry competitiveness and ease the processes of transition.

Worker Education for a Changing Economy: New Labor-Academic Partnerships

Charles Derber

Between 1983 and 1986, under a grant from the Fund for the Improvement of Postsecondary Education, a team of faculty and advanced graduate students from Boston College developed a new educational partnership with labor unions in Massachusetts to help combat problems of industrial dislocation and upheaval. In collaboration with the Massachusetts AFL-CIO, the Boston College group worked, over the three-year period, with five different union locals experiencing serious problems associated with foreign competition and new technology. The affected industries were in both manufacturing and service; they included locals of the International Ladies' Garment Workers' Union (ILGWU), the United Auto Workers (UAW), the International Union of Maritime and Shipbuilding Workers of America (IUMSWA), the American Federation of Teachers (AFT), and the Service Employees International Union (SEIU).

The project grew out of a long-standing interest by faculty in the Social Economy and Social Justice Program of the Boston College Sociology Department in helping fashion new economic and social responses to problems of job loss in core industries and of structural shifts and technological change in the economy. The Social Economy and Social Justice Program is committed to a vision of a democratic economy based on prin-

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ciples of self-management. Its emphasis is on engaging workers, with their unions, in actively developing a response to the tremors shaking their industries and in creating a secure economic future for themselves. This implies a departure from the traditional pattern that assigns to management the power and responsibility for strategic economic planning, industrial development, and revitalization. This pattern relegates workers and their unions to a largely passive role, buffeted by management decisions and confined to a position of reaction rather than proactive participation and planning. Yet experience from other countries, such as Japan, West Germany, Sweden, and Yugoslavia, suggests that, when workers are included in the planning process, they can contribute substantially to the design of new industrial strategies for enhancing industry competitiveness and smoothing the painful processes of transition.

The Boston College project, then, arose from the view shared by both concerned faculty and top labor officials in Massachusetts that workers need to play an active role in the effort to preserve and revitalize local industries. This requires, among many other deep-seated changes, a new model for labor education, and this was the specific need that our project intended to address. Workers desperately need access to many kinds of knowledge currently reserved for management: knowledge about their own industry and the nature of the new global production and market, information about national and regional economic trends, understanding of new technological developments and the kinds of skills likely to be in demand both in their own and in other industries, and education for social and economic planning and development. This kind of "economic literacy," a precondition for worker self-management and for a proactive labor movement, is not a significant part of any of the prevailing models of labor education, largely because these models accommodate the existing structure of industrial relations.

The project was conceived explicitly as an experimental, highly innovative, labor education model that could demonstrate both the possibilities and the payoffs of providing workers and unions with a tailored "economic literacy" program focusing on the current problems of their own industries. The concept was radically distinct from traditional retraining programs, since our concern was not to provide technical training for specific jobs but rather a kind of social, historical, and economic education that would give workers the tools to formulate strategies for charting their own economic future and would help them analyze, revitalize, or retool their own industries. Among the assumptions of our model were (1) the need for a *new partnership* between universities and labor federations committed to providing to labor many of the analytical tools and forms of information traditionally offered to managers and (2) the need for a *new critical social curriculum* that would stretch labor's sense of its capacities and rights to chart its own economic destiny.

Our location in Massachusetts might seem anomalous, given the widespread perception that Massachusetts has prospered, escaping the economic anguish of the Midwest and many of the other northeastern industrial states. Yet, while Massachusetts has done well in terms of aggregate performance and the strength of many of the high-technology industries, as well as in terms of the academic and financial sectors, many local manufacturing industries have experienced severe loss of jobs and capital. There have been plant closings, extensive job loss, and underemployment in the apparel and shipbuilding industries, two of those selected by the project. In addition, we selected the major automobile assembly plant in the state because its position is threatened as the auto industry both retrenches domestically to the Midwest and goes overseas. Some of the public sector has been thrown into upheaval by demographic change, budgetary austerity, and technological changes, with significant job loss among teachers and municipal service workers; thus, we chose to work with both of these worker categories as well.

Initially, we hoped to apply a relatively uniform approach to all locals. The approach would involve collection of relevant information about the particular region and industry, preparation of an "economic literacy" curriculum tailored to the particular plant, and holding of educational forums in union halls for staff and members where information could be made easily accessible in a familiar and unthreatening location. The central labor federation helped us gain access to the locals and work sites. Faculty and graduate students prepared the relevant information and curricula, based both on research and interviews with local managers, workers, and state officials, and then taught forums in the union setting. We also hoped to help institutionalize educational committees in each local that would continue this educational program once our project ended. The actual projects, as described below, varied from this template as required by individual circumstances, but we have carried out research, prepared "economic literacy" curricula, and taught forums or seminars in each of our local sites as conceived in our initial model.

Initiating the Project

The cooperation necessary to create the Boston College-AFL-CIO partnership started with the project itself. Project faculty had no prior contact with state labor leaders, although we had relations with some labor organizers and local leaders. One local leader who liked the idea of the project arranged a meeting with top state labor federation officials. It was in this meeting that a cooperative program crystallized. The president and secretary-treasurer of the Massachusetts AFL-CIO recognized the severity of the problems faced by manufacturing industries, for they had been involved in plant closings and were members of state commissions connew directions in the union. Two staff members of our project, both advanced graduate students in sociology, spent several months preparing an in-depth analysis of the global and domestic shipbuilding industry; they also carried out intensive surveys of workers in each of the yard's major departments concerning its technical and organizational problems. The analysis and the survey results were compiled into a report about the industry and the yard, and this report served as the basis of several educational forums with the union's executive board and its stewards.

Unfortunately, this educational work did not lead to the kinds of continuing education and organizational change that would help the union and the yard survive. Major internal and external events frustrated our ongoing efforts, leading to no major changes in union policy and no deep commitment to the educational process that had begun. On the one hand, political divisions within the union overwhelmed its capacity to act concertedly in a new direction. The president had an uneasy relationship with some important groups in the union and ultimately resigned, placing the project under the sponsorship of a new president. The divisive political climate was not conducive to our continued presence and work. Although we established a relationship with the new leaders, it was not possible to carry on a sustained, innovative educational program that would have the full commitment and support of the union.

The press of external events also overwhelmed our efforts. In less than two years from our initial contact, the position of the yard had become untenable, with the completion of a major project and failure to win any new major navy or commercial contracts. In 1985, General Dynamics closed the yard, terminating the jobs of several thousand employees.

Other Projects

Projects with other unions have gone forward with varying degrees of success. Work with the Boston teachers' union has helped the union develop an educational program on the social and technical implications—for teachers, students, and the process of education itself—of the increasing use of computers in the schools. A project team is working with the Service Employees Union in Boston to implement a skills assessment, development, and training program for union members whose career mobility seems blocked in city hospital and other municipal settings. For two years, the project has also worked with a United Auto Workers local on the broad kinds of technical, economic, and organizational knowledge its members will require to keep their assembly plant competitive in the new global auto market and to preserve their own jobs in the face of rapidly spreading robotics and computer technology.

Lessons Learned

The project experience confirms that unions now need new forms of knowledge to survive. Traditional labor education on the nuts and bolts of collective bargaining, the grievance procedure, and enforcement of the contract remains important but far from adequate. As the viability of their industries is put to the test, unions must assimilate a broad range of economic, managerial, and sociological knowledge along with new technical skills. Our experience suggests that unions, under auspicious circumstances, will recognize the need for such training and participate actively in innovative programs.

A primary lesson learned is that the unions must play a role in the development of these innovative curricula. Workers themselves are the repositories of much of the knowledge required to understand their changing industries and jobs and of the strategies required to save them. Worker education for "economic literacy" not only means transmitting ideas and information from economics and other social science disciplines but it also means helping workers crystallize and pull together their own observations and insights about how their industry is being transformed, and it means facilitating their own process of developing options for themselves and their union.

Workers and their unions in declining or rapidly changing industries are understandably distrustful of outsiders, including academics, who claim to have knowledge relevant to their predicament. It is their jobs rather than those of the educators that are on the line. They instinctively look to trusted union brothers and sisters in the same boat rather than to those who have not shared either their experience or the risks they face.

Worker education for "economic literacy," then, must be especially sensitive to matters of trust, participation, and politics. We found it essential to develop close and relaxed working relations with influential union officials before we embarked on the joint design of educational programs for their members. The development of these relationships requires far more time and patience than we had anticipated—often more than a year simply to establish the requisite trust.

Substantial time is required as well for any outsider to get the "lay of the land" both within the union and the plant and in the industrial environment in general. Educators need to understand the political currents and alliances within the local unions, for example, in order to know what kinds of issues are salient and which issues are so divisive as not to be viable for presentation and discussion. It is also critical for educators working with local unions to identify key individuals capable of mobilizing broad support within the union for new programs. We developed important relations with "internal sponsors" in our more successful projects; these sponsors could help steer us through delicate political problems and find ways to build interest and support for educational programs in unions that had not previously sponsored or been involved in them.

We found it difficult in all the locals to mobilize serious commitment to these new educational endeavors. This reflected the press of other demands on staff, distrust of academics and higher education, and organizational inertia. Innovative educators must find ways of framing their "curricula" around problems already understood by the union as critical. In our garment project, this meant tying our forums concerning the internal organization of the industry to issues of government trade policy that already engaged the union. Educators have to be flexible in their presentation of ideas and learn to promote new curricula in ways that appeal to the existing thought and agenda of local unions.

Both educators and unions must experiment with new relations and programs, facilitated by "educational brokers" such as FIPSE. Another model showing great promise is that developed by the joint UAW-GM Human Resource Center in its Paid Educational Leave program for auto workers. Mandated and funded by provisions in the latest contract, the Human Resource Center has sponsored the development of an "economic literacy" and "governmental process" curricula for local UAW officials throughout the country. This program seeks to do on a national level for one union what we have tried to accomplish on a smaller scale for selected local unions in Massachusetts. The UAW program has brought in well-known academics, government leaders, and experts to help shape a highly innovative and sophisticated union-oriented curriculum for understanding the governmental process, the international economy and the changing position of the U.S. auto industry, the changing character of industrial relations, and new roles and options for unions. The Human Resource Center is now experimenting with pilot programs to carry forward this project at selected local plants with rank-and-file members.

Conclusion

Reaching the rank and file with programs of this sort is the greatest challenge for continuing educators. It requires close working relations between educational institutions and local unions, as well as a willingness by educators to adapt both their traditional curricula and their pedagogical style. The curricula for these programs must be developed through close consultation between academics and union officials and members. Courses should in many cases be held in the union hall rather than on the campus.

Long-term development of such programs wil require new partnerships between postsecondary institutions and local and state labor federations. Our project was possible only because of the sponsorship provided by the Massachusetts AFL-CIO. Problems of access, trust, logistics, and politics would never have been resolved without a close working relationship between the Boston College staff and an AFL-CIO coordinator. Bridging the unfamiliar terrain between colleges and labor organizations requires investment of resources and commitment to the endeavor that neither postsecondary institutions nor unions have shown until now. The present problems facing the economy may provide the incentive for both to get down to the new pressing educational tasks at hand.

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Both content and method are designed and adapted to the learning environments of rural communities, with the focus on the use of the computer as a tool.

Computer Education Opportunities for Rural Adults

Mary Emery

Technology is likely to have a great impact on rural communities; rural people, however, often lack the resources to learn about technology. The Rural Education/Adult Development in Idaho (READI) project offers a unique approach to teaching rural adults about computers. The READI project is designed to provide access to computer literacy for adults who live where such opportunities are otherwise unavailable. The pilot for the project was financed by the Fund for the Improvement of Postsecondary Education and the Idaho Cooperative Extension Service in cooperation with the University of Idaho. During the pilot study, the project developed and tested a curriculum, designed a method of training people to use that curriculum, and tested a community-based delivery system. In less than three years, over 600 adults have enrolled in READI classes in fourteen rural locations. The project has also had a significant effect on elementary and secondary education in many of these areas.

Need for the Project

The READI project was developed not only because of the demand for computer education in rural areas but also because of the concern that

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rural areas with no access to computer training will continue to be left behind in this age of new technology. Opportunities to learn about computers are important to both individuals and to communities. Such opportunities are particularly important for those areas where the traditional rural industries are no longer able to support large portions of the population. Programs that foster the development of computer-related skills among rural adults can be vital resources in such communities. For instance, efforts in both job creation and economic development in these areas are likely to be related to new technology and to require employees who are already computer literate. In addition, the computer-literate consumer is increasingly important to the smooth flow of business as more and more establishments add computerized customer services. The role of computers in their children's education has encouraged many adults to narrow the generation gap by becoming computer literate. Finally, many rural adults seek educational opportunities in computers simply because of the fascination they have for the new technology.

Access to computer literacy programs is not the only problem rural adults face. Often, even when such programs do exist, they do not meet the needs of the students. For example, many existing courses focus exclusively on programming or on learning a specific software package. Teachers often assume that students have high levels of verbal and math skills, an assumption that results in many people dropping out. Those who do finish are often unable to use what they have learned because they do not know how to apply that knowledge to existing job and home situations. What is needed is a class that can acquaint adult learners with the computer and its uses as a tool for decision making and information management without making assumptions about verbal and math skills. The READI approach to computer literacy has been designed to provide a relevant and useful introduction to the computer and to computer applications by focusing on the computer as a tool.

The goals of the project were to develop an effective and appropriate curriculum and to pilot a cost-effective delivery mechanism for that curriculum. During the first year of the project, the curriculum was developed and the test sites selected. During the second year, we tested and modified the curriculum. In addition, the READI State Advisory Board began working on suggestions for making the project self-sufficient at the county level. During the third year, we offered the program at additional sites, completed the project evaluation design, and disseminated the project to other areas.

The READI Approach to Computer Literacy

The READI approach to computer literacy is multifaceted. The goal of providing computer literacy is coupled with an understanding of the need for basic skills review, practice in problem solving and decision making, and work or education referral information. READI also emphasizes an appreciation for rural values and life-styles, and the curriculum is learner centered; it focuses attention on the needs and concerns of the specific students it serves. Finally, since education does not take place in a vacuum, the READI project is designed to address implications for the future and to enhance critical-thinking skills so that rural adults may play a more proactive role in the information age.

An educational program designed to bring computer literacy to rural areas must address the factors that prevent rural adults from entering the computer age. Access is, of course, a critical factor because many rural people live too far from existing educational programs, and these programs have neither the resources nor the expertise to conduct courses in more isolated areas. Further, these rural communities cannot by themselves provide educational opportunities for their residents. These external factors can be overcome. The READI project provides a model for using local resources and expertise in developing low-cost courses in computer education for adults.

Such internal factors as poor esteem, lack of basic skills, math anxiety, and inadequate communication skills also prevent rural adults from taking advantage of whatever educational opportunities may exist. Local ownership and control of the program tend to break down such barriers for adults who want to attend computer courses. The READI curriculum has been designed to include activities that foster self-esteem and encourage self-motivation as well as those that review basic skills.

The READI curriculum design is intended to enhance problem-solving and decision-making skills, as well as to teach people about computers. Actual class activities are designed with two principles in mind. The first principle is that adults learn best by doing, particularly with activities that have a direct application to some part of their lives. For hands-on activities to be successful, however, the instruction must go beyond drill and practice and must involve the students in the discovery of knowledge. Such activities will also help participants to retain what they have learned and to integrate new knowledge more easily into everyday life.

The second principle is that interaction among peers can provide a very effective context for learning. Participants increase each other's understanding and self-confidence by sharing feelings and successes, by comparing problems and solutions, and by teaching each other. Since one of the goals of READI is to provide a learning experience that empowers participants to take hold of new opportunities, it is essential that the courses provide a setting where ideas can be exchanged and individual goals can be enhanced.

In short, neither content nor method in the READI curriculum represents a technical approach to providing computer literacy; rather, READI approaches computer literacy from a problem-solving focus with an emphasis on group interaction. The design reflects the recognition of a variety of types of expertise and of the need to share information in a meaningful way so that learning is both an exciting experience and a new discovery.

Using the computer in problem-solving situations also provides an opportunity to review basic skills. Since many rural adults did not finish high school, had an inadequate high school experience, or simply have allowed their basic skills to become rusty, it is desirable to provide some review and instruction of these skills. We cannot produce computer-literate adults without also dealing with illiteracy in other basic areas. While the READI course is not a substitute for an adult basic education or high school equivalency program, the curriculum has been written with attention to this need. Thus, reviews of math and writing skills necessary for specific types of problems are included. Clearly, if we are to empower adults by helping them become computer literate, we must address those skills that help individuals to write correctly, to estimate answers, and to use correct formulas.

For example, participants can review their math skills using the computer in small groups both to solve word problems and to construct them. While doing complicated math problems on computers, some using a spreadsheet and others using the computer in immediate mode, students can see how attention to order of mathematical operations is essential for effective computer use. During this class session, instructors also discuss the importance of estimation skills for computer users, and they provide instruction and practice time for students to work with estimating answers that they can then check on the computer.

Just as teaching someone how to use a hammer or a sewing machine involves much more than just teaching them how the tool works, providing computer literacy courses also means teaching students how to apply the computer as a tool. The READI approach focuses on common situations such as family budgets and mailing lists in order for students to learn how to apply the computer's power. In addition to these common applications, each participant is encouraged to apply a variety of computer tools to situations in his or her own life. In previous READI classes, for example, a small-town government clerk experimented with putting her records on a data base, a number of people looked at keeping their small-business records on data bases, and teachers made electronic record books.

In summary, the READI approach to computer literacy includes the following:

- Examining the social, political, and economic impact of computers on the future of individuals, communities, and the larger society

- Reviewing the skills necessary to apply the computer as a tool, including problem solving, decision making, math, writing, and information organization
- Helping participants gain confidence in using the machine by teaching computer terminology and basic programming skills
- Creating an opportunity for participants to learn how to manipulate and use data as well as to understand how computers store and use data
- Empowering individuals to make more informed decisions about their future and the role of computers in that future.

Preparing the Teachers of READI

The week-long READI Summer Institute prepares teachers to present classes in computer literacy. Many people interested in opportunities for adults to learn about computers overcome their reluctance to offer such courses when they have an already-developed curriculum and an opportunity to see how the class sessions work. At the institute, selected activities are modeled for participants so that they can see how the activities flow together. Additional time is spent learning about the problem-solving approach to teaching computer skills, about working with adult learners, and about setting up a READI class. Finally, each institute Fellow has an opportunity to develop a lesson plan using READI materials and to present it to the group. This exercise gives everyone a chance to learn from the different presentations and to get feedback on their style. Additional creative ideas are generated and shared in these sessions.

Making READI Available to Rural Adults

The READI project has been successful because it provides for maximum flexibility. It also places some of the responsibility, as well as some of the risk, on the rural communities themselves. READI provides an opportunity to expand local expertise and resources in both computer-related activities and leadership development. In Idaho, READI became one of several volunteer-run projects in the rural counties. The same method of organization could be used for other continuing education or community education programs.

The READI project has been developed on the assumption that local communities or county committees will take responsibility for running the project on the local level. University extension or continuing education programs share responsibility by providing additional expertise, help with networking, and access to a support person. This arrangement of shared responsibility and risk results not only in a program with local ownership and control but with expanded resources.

READI community advisory groups are organized to oversee the READI project on the local level. They play a vital role in the program's success. The committee is an essential link in the transition from a generic statewide project to an effective local program. The committee oversees the selection of local peer teachers, handles the logistics of setting up the program, and recruits the participants. In addition to adapting READI to local needs and resources, the committee participates in evaluating the project's successes and problems. The committee is also responsible for developing useful and up-to-date referral information for READI participants. By researching opportunities, the committee helps READI participants not only to see the READI experience as a stepping-stone to other activities but also to use the acquired skills in making a contribution to the community. The advisory committee uses the experiences of READI participants and their own knowledge of the community to plan future directions for the project in their location.

In addition to administering the programs at the local level and developing relationships with local resource people, the community advisory committee is also charged with developing a strategic vision of how technology will influence the area and with implementing strategies for maximizing the positive impact of technological change. Since rural areas are known for the way they cherish traditional values, the committee must mediate between the need for constancy within the community and the press for change. For each community, as with each individual, this balance is unique. What is acceptable in one area may not work in another. The READI approach provides for flexible schedules and program design, allowing classes to differ from community to community. The local committee monitors the success of the courses based on local criteria; the central office or support person monitors the quality of the instruction.

The actual classes are facilitated or taught by peer teachers, chosen not only on the basis of their understanding of computers but also because of their involvement with adults and their interest in educational or job-training activities. These peer teachers receive training in teaching computer literacy to adults at the READI Summer Institute.

By providing resources to local people, the project helps to foster local expertise, both in computer education and in leadership development. The READI project is, at heart, a grass-roots program encouraging active and meaningful participation by everyone in all aspects of the program. Part of the success of the project has been the development of local ownership in the program and, hence, local investment in its success. Developing local leadership skills in the planning and development of programs and in computer technology allows communities to make better decisions related to the impact of new technology and to apply this expertise to local conditions and concerns.

Developing Partnerships with Others

The READI project is essentially a partnership between an educational institution and community groups. Over 600 rural adults have enrolled in READI classes, and an additional 250 have participated in READI-sponsored community computer expositions. We estimate that forty kindergarten through twelfth-grade teachers have used READI materials in their classes, affecting approximately 2,000 students.

READI has also had an impact on the communities in which it has offered classes. Two counties, for example, completed a survey of computer use in their area. Two other counties have developed community education or continuing education programs for rural learners as a result of the READI experience. Several counties have participated in economic development projects.

The project also provides a means for working with other agencies and institutions. For example, many school districts have benefited because one of their teachers is a READI instructor. This instructor is able to bring new ideas, materials, and resources into the school as a result of the READI connection. READI benefits, in turn, because the instructors introduce READI courses into the schools. In other partnerships, the Cooperative Extension Service and vocational education programs in small-business management and farm management provide follow-up to the READI classes. Local businesses have sent employees to participate as READI students and as advisory committee members. Finally, READI graduates have often returned to school for credit classes.

Summary

Idaho, like many other states with large rural populations, must come to terms with the increasingly desperate economic and social problems resulting from high levels of unemployment and deindustrialization, lack of mobility, declining educational resources, and technological illiteracy. Computer literacy programs provide a means for dealing with change because they offer resources to break this vicious cycle of poor educational background, high unemployment, and increased social problems. The success of the READI project illustrates that bringing educational opportunity to rural communities can affect both an individual's and a community's future in a positive way.

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Practical skills related to foreign trade are provided to small businesses that may have a product to export.

Educating Small Business for an International Marketplace

Barbara H. Moebius

The increased importance of international markets to both local and national economies and the staggering trade deficit are the impetus for the International Trade Technical Center at Waukesha County Technical Institute in Pewaukee, Wisconsin. This center presents workshops with hands-on practical experience for small and medium-sized businesses in the conducting of international trade; it also develops instructional materials to be used in group and autotutorial settings, and it disseminates these materials around the country.

"Export for America's Future," the theme of World Trade Week, May 1986, reflects the importance of exports to our nation's welfare. There was a time when exporting had a low priority in the United States. The vast size of our domestic markets and the ease with which American goods were sold abroad after World War II allowed us to become complacent. There was little foreign competition.

All of that has changed drastically. According to U.S. Department of Commerce figures, since 1960 our share of world trade has dropped from 18 percent to 15 percent. Today, 70 percent of all U.S goods compete at home and abroad with foreign-made goods. In 1985, the value of manufactured goods exported by the U.S. trailed West German and Japanese exports by sizable margins. As a percentage of gross national product,

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U.S. exports declined 20 percent from 1979 to 1983. This rate far exceeded that of any other major industrialized nation. Only 10 percent, or 30,000 out of 300,000, U.S. firms export. Less than 1 percent of those firms do 80 percent of the exporting. The Department of Commerce estimates that 18,000 more firms have exportable products, but ignorance of the opportunity and fear of the unknown are among the major factors preventing them from entering the global marketplace.

Compounding these problems is the fact that the U.S imports far more than it exports. The last time a trade surplus was registered was in 1981. Alarming increases in the trade deficit, from $9 billion in 1982 to $148.5 billion in 1985, alerted the nation that something needed to be done.

Nowhere has this been more obvious than in what has come to be known as the Rust Bowl of the Midwest. Old manufacturing cities with smokestack industries that were once flagships of the region have been hard hit by foreign competition from automobiles to machine tools. Layoffs and plant closings have become common. For every $1 billion in lost exports, 25,000 jobs disappear. Surviving industries and entrepreneurial efforts clearly need workers trained in international trade if they are going to compete in the global marketplace.

Some of the businesses affected by the changing economy are of sufficient size to develop their own international training divisions. Others, however, belong to the small-business category that is responsible for the creation of two-thirds of the new jobs in this country. The health of these small businesses is critical to the national economy, but they are too small to have their own international resource and training facilities. They are not familiar with the complex, nation-specific regulations for exporting, and they quickly become discouraged by the complexities with which their initial efforts are met.

The Associate Degree Program

In 1983, Waukesha County Technical Institute (WCTI), located on the western edge of the greater Milwaukee metropolitan area, began a two-pronged approach to addressing the issues just described. In direct response to requests from area employers and on the basis of a market survey that assessed the level of employment opportunities for graduates, the associate degree in international trade was offered in 1984. Enrollment quickly grew from thirty-eight in 1984 to more than 100 in 1986.

The International Trade Technical Center

In 1985, WCTI began development of a resource and reference center that would contain extensive information on all aspects of international trade. Trained personnel at the center would help area businesses find needed information, and this staff would be available to answer questions over the telephone. The references would include indexes, handbooks, directories, and guides to foreign firms; worldwide marketing, statistical, and media guides; country and regional information; journals, periodicals, and newspapers; government publications and forms; and audiovisual materials.

With a two-year grant from the Fund for the Improvement of Postsecondary Education, the proposed resource and reference center became an actuality. Called the International Trade Technical Center, it works closely with business and industry to determine the type of continuing education and training programs needed for effective participation in the global marketplace, both by companies presently engaged and by those new to exporting. An advisory committee composed of twelve local representatives from small and medium-sized businesses, government, education, transportation, finance, and an export management company guide the selection of programming, target markets, reference materials, and available services. Members also offer suggestions on cooperation and coordination to avoid duplicating other services in the metropolitan Milwaukee area.

The Workshops and Target Audiences. Sources of rudimentary training at the local level on a continuing education basis have been, for the most part, unavailable in the Midwest. Training centers that are already established focus on the needs of executives and other top management personnel in larger firms, and these are mainly located on the East and West Coasts. In contrast, the objectives of the International Trade Technical Center include customized training for owners of small and medium-sized firms whose prosperity depends on extending their markets into other nations. Many of these are managed by self-made entrepreneurs with narrowly focused technical educations or business skills. Many managers lack research skills needed to expand their businesses to include exporting. The first workshop offering, "Developing an Export Program," was targeted for this group.

The center also offers training for skilled technical and clerical employees whose responsibilities have been increased to include some aspect of international trade. In smaller businesses, the employer usually does not provide specialized training. Two highly successful workshops, "Export Documentation and Payment Methods" and "Moving Cargo Internationally," were designed for this group. They focused on providing hands-on practical experience in preparing documents related to the flow of goods and money internationally, and they presented an overview of air and ocean transportation and the shipment of hazardous cargo. A tour of a cargo-loading vessel helped participants see how their products were handled.

A third target group includes food distributors and agribusinesses who need to diversify products and markets. This audience needs to acquire a more comprehensive understanding of the global marketplace. A workshop on "Opportunities in Asia" focused on understanding market potential and special export requirements for this region. Upcoming workshops include "Communicating Internationally" and "How to Find an Overseas Distributor."

Current students in the WCTI associate degree program in international trade also benefit from the workshops through enhanced educational opportunities and interaction with practitioners in the field. For example, a seminar entitled "Trade and Investment Opportunities in Thailand" is being held with no charge to the public; all students, regardless of their financial resources, will be able to take advantage of it. (Normally, workshops cost $50 for a full-day program.)

The potential audience of the workshops has been extended greatly by videotaping each one. Every issue covered in the seminars has been edited and packaged as stand-alone information on the practical aspects of international trade. Any business or continuing education agency may contact WCTI for use of these tapes at the nominal cost of reproduction. They are available from the International Trade Technical Center at Waukesha County Technical Institute in Pewaukee, Wisconsin.

The workshops offered by the center provide information and skills that are directly transferable to the workplace, with virtually no emphasis on theory. Participants bring questions to the workshops that have arisen in their daily work life. They receive immediate, relevant answers from the workshop presenters. This process integrates the information they are learning with the work setting in which it will be used.

Organizations can now let the center know about their specific continuing education training needs, and it will respond with customized training programs. These businesses can use the videotaped materials to conduct in-house training programs for employees who are unable to attend the original workshops.

Other Services. Since public awareness of international trade issues has increased, more programming is being offered by a variety of state and federal agencies, local trade clubs, educational and financial institutions, as well as private consulting firms. As a public service, the center provides dissemination of information to over 6,000 potential users of this type of continuing education, minimizing duplication and increasing awareness and participation in educational opportunities statewide.

A support group for those new to exporting has been organized through the center. This group, cognizant of the difficulties they faced in their earliest efforts toward exporting, is trying to reach the small business with an exportable product that is not aware of the potential market abroad and is not a member of a world trade organization. The U.S. Department of Commerce, International Trade Division, attempts to do this, but budget and personnel costs have seriously curtailed their efforts. In addition to identifying businesses with exportable products, the support group is developing a fact sheet with answers to the most basic questions asked by someone considering exporting. More important, a resource pool of experienced exporters who are willing to answer questions by telephone on specific topics is developing. The impetus for this group came, not from the center, but from several businesses that had used our services. One key to success for a center such as ours is just this type of responsiveness to what the target market tells the center it needs.

Lessons Learned. Initially, we thought that two- to three-day workshops that exhaustively treated each topic would be the best way to provide continuing education for those already employed. We discovered, however, that it is difficult for employees to be away from their duties at work for more than one day at a time, and we modified our workshop format accordingly.

Similarly, we expected small and medium-sized businesses to utilize the center on a drop-in basis, but we have found they often do not have the time or the staff to spare for research. For preliminary reports, they much prefer to contract with the center to provide the needed information. During the second year of the project, information will be gathered on an ad hoc basis by using students from the associate degree program. In this way, the center will provide a service, the students will gain visibility with area firms, and the firms will obtain the information they need. When federal funding runs out, we hope that these firms will recognize the importance of the center and become a source of financial support for continuation of the service.

Outcomes. Project outcomes include: a growing awareness of the global nature of the nation's economy; development among local small businesses of the necessary skills for export activities, including accessing and utilizing resources of information; and increasing sensitivity to cultural differences affecting business practices in other nations. Students in the associate degree program are gaining the ability to compete in the arena of international trade by developing marketable skills. Through the videotapes and self-paced learning materials, other businesses and postsecondary institutions are improving and extending their educational programs.

The Value of Partnerships

Recognition of the importance of international trade through almost daily articles in the local newspapers has spawned the development of more programs in this area. It is important to establish channels of communication and coordination with such other local undertakings.

Lessons from the case studies offer new considerations and directions for integrating education and work.

Improving Practice: Lessons from the Case Studies

Catherine A. Rolzinski, Ivan Charner

The six case studies presented in this sourcebook provide examples of educational institutions entering new partnerships to respond to problems arising from the changing economy. The projects suggest future possibilities for innovative connections between continuing education and economic concerns. The Education and the Economy Alliance also has implications for the entire range of postsecondary education as well as for business and industry, for community leaders and organizations, and for counselors and planners in related fields.

In Chapter One, we traced the structural changes facing the economy and put forth a framework for examining the resources that comprise the continuing education enterprise—clients, content, modes of delivery, and sources. In this chapter, we will take a second look at these resources and determine what they can mean for integrating education and work when the framework is applied to actual practice.

Lessons drawn from the case studies are in some ways specific to each project, but there are also important themes that transcend the separate projects. These more generic themes are shared not only by the six projects presented in this volume but also by all twenty-five of the projects in the alliance. The themes introduce another perspective for practitioners to use in conceptualizing or planning a collaborative effort between edu-

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cation and new partners, such as business, unions, the community, or a new group of adult learners.

We will use the case studies themselves to explore the components of productive partnerships and emphasize the issues of time and community-based perceptions, of position and authority, and of flexibility. We will also look at what the case studies tell us about the meaning and functioning of community, about community leaders and organizations, and about the ramifications of position. Finally, we identify new directions for integrating education and work on behalf of the adult learner.

Productive Partnerships

Establishing new partnerships was a strategy selected by all twenty-five projects in the alliance to respond to problems resulting from changes in the economy. The experience of forming partnerships between educational institutions and businesses, unions, government agencies, and community groups made the issues of the partners' different perceptions and perspectives a common refrain in the project stories. Intangible and unforeseen conflicts involving questions of tradition, orientation, points of view, culture, responsibility, attitudes, and mission were identified as some of the most serious, complex, and sometimes insurmountable problems, especially in the planning and early implementation stages. Time to deal with these issues was an ongoing need.

Time and Perceptions. A tremendous amount of time and care must be taken for all of the partners involved to get to know one another. This process requires from each partner a willingness to increase self-awareness and to gain valuable new insights into idiosyncratic ways of perceiving roles and missions. Only when this process is recognized from the beginning as a continual and invaluable priority will new partnerships have the expanded perspective needed to accomplish their goals.

The importance of giving time and attention to perceiving and confronting assumptions is supported by the case studies. In Chapter Four, for example, Lamdin and Hassan ascribe the "agonizingly slow first six months" of the Business Development and Training Center to just such underlying assumptions: "Public relations efforts were inadequate, and, even among those who had heard of it, the BDTC was viewed as an unknown quantity with an imperfectly understood mission." For this project, the process of relinquishing predetermined perceptions was definitely a two-way street; as the authors conclude, "This new educational services model, created in the high-minded naïveté of the academic world, has had to make a myriad of adjustments to the reality of corporate America."

In Chapter Five, Derber describes similar discoveries:

> We found it essential to develop close and relaxed working relations with influential union officials before we embarked on the joint design of educational programs for their members. The development of these relationships requires far more time and patience than we had anticipated—often more than a year simply to establish the requisite trust.
>
> Substantial time is required as well for any outsider to get the "lay of the land" both within the union and the plant and in the industrial environment in general.

And in Chapter Seven, Moebius states:

> The greatest difficulty in undertaking the task of building something from nothing is time. Having carefully planned what needs to be done and then how to go about doing it, project designers often expect things to happen much more quickly than they do. In retrospect, our planning probably did not take into account all of the individuals, departments, and divisions that needed to be coordinated in order to make the plans a reality.

These excerpts from the case studies exemplify what can be learned from candidly taking stock.

One problem of new partnerships between education and business is that, even with the best of intentions, it is difficult for each party to realize and overcome stereotypes about the values and operating principles of the other, as Skinner, Siefer, and Shovers point out in Chapter Two: "Despite enthusiasm about expected benefits and mutual respect, educators and employers are most likely to abandon partnerships of this type . . . because of differences in customary approaches to work." Each organization has its own distinct pattern of behavior. In entering a partnership, each organization faces challenges to its long-standing traditions and accepted behavior. Power and decision-making authority are also threatened as the prospective partners struggle over how to share their new roles and responsibilities.

Position and Authority. The position within the overall structure of the project director, as well as his or her relationship to visible authority and the power to sanction, were crucial to the success of the projects. In addition, the placement of the project within the most appropriate organizational unit in the partner organization was very important. Perceptions of legitimacy depended upon positioning, and this was often a critical factor in the transition from the project being viewed as marginal to its full acceptance by the partner organizations. Langer makes this clear in Chapter Three:

> The numerous and timely decisions necessary for the project's success demanded top administrative support. MATC's

> dean of the Technical and Industrial Division, as well as the executive dean, chief executive officer, and the board of directors were all committed to providing the support and flexibility required by the project. The top-level assistance was needed to overcome the confusion of the bureaucratic maze, state contract laws, the budget process, and to meet important timetables and negotiate industrial partnerships.

In Chapter Six, the issues of positioning and authority are resolved through community "ownership" of the project:

> The READI project has been developed on the assumption that local communities or county committees will take responsibility for running the project on the local level. University extension or continuing education programs share responsibility by providing additional expertise, help with networking, and access to a support person. This arrangement of shared responsibility and risk results in a program with local ownership and control but with expanded resources.

Flexibility. By recognizing the importance of the factors related to perceptions, time, and positioning, partners ensure flexibility in their collaborative education and work programs. One primary reason for the importance of such flexibility is illustrated in Chapter Two:

> The structure of relationships between educators and the workplace must be flexible enough to survive the frequent changes that occur in the workplace. . . . In a little more than two years, the Honeywell liaison person with ASU changed three times. In addition, many of the key members of the partnership changed their job positions and locations within the company several times when major staff reorganizations occurred.

The closer we look at partnership arrangements, the more we see this need for flexibility. The early planning relationship between potential partners is a conceptual stage, and, as the concept is translated to action, the priorities and style of the partners will merge. The sharing of information, personnel, responsibility, and programming produces a halting movement forward as formal policies and procedures and informal methods of implementation are changed. Only partners who are open and flexible and who can agree to go "back to the drawing board" as often as is necessary will bring conceptual ideas to functioning fruition. As the

partners move toward their common goal, however, a spirit of collegiality and shared ownership evolves.

The case studies validate the conclusion that the integration of education and work is not easy, nor is there any one prescriptive guide that provides all of the answers to any particular situation. Partnerships between education and businesses, unions, government agencies, and community groups are not yet a natural condition in this society. Many linkages arise in reaction to problems from changing economic forces, and this reactive condition compounds the complexity of achieving productive partnerships.

The usual planning approach in such new partnerships begins with identifying the economic problem to be addressed. Then, strategies are developed that focus on the elements of clients, content, modes of delivery, and sources. Drawing from the alliance experience, however, the considerations deemed to be more complex in the planning stages are those relating to perceptions, time, position, authority, and flexibility.

The following questions can help guide the planning process toward establishing more productive partnership programs:

1. What are the benefits and risks for each institution or organization in the partnership?
2. Where does decision-making authority for the project sit among the leaders of each postsecondary institution, business, union, community group, or government agency?
3. What are the powers, resources, and perceptions that accompany the project placement?
4. What are the perceptions and stereotypes held by each group in the partnership about the nature, style, mission, and content—the "culture"—of the other partners?
5. How much serious time and attention are the partners willing to give to the more subtle and unforeseen problems that relate to the cultural differences between them?
6. How can flexibility be built into the partnership arrangement?

Education and Community Economic Development

Key elements for integrating education and work have to do with the perceptions and involvement of the community to be affected by the economic development endeavor. The notion of community and all of its ramifications has been central to the success of most of the projects in the alliance.

Community. The term "community economic development" refers to planning and implementing programs to improve the economic well-being of people within their social context. Getting to know a community or doing a needs assessment of a community is considered standard practice in the process of designing economic development programs and strategies. But just what is a "community"?

For our purposes, a community is defined as a group of people who perceive things in a common way or have interests, work, tastes, ownership, or participation in common. Currently, at least three distinctly different kinds of communities have a need to work together—education, business, and adult learners.

Frequent usage of a word like "community" can inure new partners to its meaning; without intending to do so, they will interpret other people's situations based simply on their own sense of community. With different perceptions coming from the education, business, and adult-learner communities, tremendous barriers can be created.

Knowing how to dress, talk, and socialize appropriately comprises part of the "culture" of a community. All of these known elements provide community members with a certain degree of security that can be easily shaken when faced with the unfamiliar. For educators to collaborate successfully in economic development endeavors, they need to look beyond the demographics and relinquish their own sense of security in order to try to experience people's circumstances within their different communities. This process is essential to building trust and provides the groundwork for effective community economic development.

One of the most important notions of community boils down to interdependence. Despite opposing forces, Americans seek a sense of community and have difficulty facing a change in life-style. In the Northwest, for instance, the majority of workers in the timber industry have stayed on long after their jobs have ended. Unemployed and displaced workers are often proud people who have gained a tremendous amount of knowledge and skills that seem to have no current value. These adults may confront the prospect of education as a means to a new way of life, but for many of them the prospect of further education is more remote than a foreign country.

Community Leaders and Organizations. Existing community-based organizations and the "right" community leaders can serve as bridges between communities of people in need of improved economic opportunities and the continuing educators who want to help. Most community-based organizations are involved in some kind of community education with such common characteristics as the following:

- Serving the community via a grass-roots approach
- Relying on forms of learning not identified with traditional postsecondary education
- Relating more to function than form in education and training programs
- Practicing a democratic process in local community improvement.

Many community-based leaders have a bias against educational institutions, and traditional educators often have their own biased views of community-based educators and organizations. Community leaders often feel that educational institutions do not recognize and appreciate their distinctiveness and cannot develop and deliver educational programs appropriate to their particular community needs. On the other hand, traditional educators rarely have had the training or the organizational support to allow them to experience community-based education. Since each group comes from such disparate backgrounds and collaborative attempts on both sides have often been limited and superficial, mutual suspicion can prevail. The case study of the READI project (Chapter Six) offers a clear example of acknowledging the special characteristics of each community:

> Since rural areas are known for the way they cherish traditional values, the committee must mediate between the need for constancy within the community and the press for change. For each community, as with each individual, this balance is unique. What is acceptable in one area may not work in another. The READI approach provides for flexible schedules and program design, allowing classes to differ from community to community. The local committee monitors the success of the courses based on local criteria.

When such an advisory committee is formed, the important question to guide the selection of members is, "What parts of the community, higher education, and business need to be represented?" This lesson is clearly demonstrated in Chapter Three's case study:

> A steering committee was appointed to guide development of the project. Committee members included leaders in automation who represented the industries to be served by graduates and retrained employees. Representatives of labor unions, professional associations, high schools, and universities also served on the committee.
>
> Significant factors in the project's success were the use of community leaders and the infrastructure of the committee itself.

Integrating Education and Work on Behalf of the Adult Learner

Who are the prospective learners in education and work ventures? First, most of these potential new students are adults. Today, many of these adults are in their thirties, forties, or fifties and have been working in, and identifying with, a particular kind of industry for most of their lives.

During the three years of the alliance's existence, the twenty-five project directors came together three times a year to share experiences and to identify emerging themes that might highlight policy implications or new directions for integrating education and work. Three of the most prominent themes that surfaced were learner-centered education, economic literacy, and liberal education.

Learner-Centered Education. Adult learners are mature and experienced; they are looking for educational programs that are responsive to their employment needs and to their responsibilities as citizens. With the backgrounds that these new students bring to adult, continuing, and extension education, they tend to respond to a different kind of pedagogy than that of traditional postsecondary institutions. Appropriate pedagogy includes a more active and participatory kind of learning; this is not the style employed by the majority of faculty.

Improved educational opportunities are needed that focus directly on the conditions and situations relevant to and identifiable by the adult worker. New programs to integrate education and work ought to convey the centrality of the learner in the educational process through the design and delivery of content, instruction, and skill development that empower the learner. As Emery points out in Chapter Six:

> The first principle is that adults learn best by doing, particularly with activities that have a direct application to some part of their lives. For hands-on activities to be successful, however, the instruction must go beyond drill and practice and must involve the students in the discovery of knowledge. In short, neither content nor method in the READI curriculum represents a technical approach to providing computer literacy; rather, READI approaches computer literacy from a problem-solving focus with an emphasis on group interaction.

Economic Literacy. As the Boston College experience (Chapter Five) suggests:

> Workers desperately need access to many kinds of knowledge currently reserved for management: knowledge about their own industry and the nature of the new global production and market, information about national and regional economic trends, understanding of new technological developments and the kinds of skills likely to be in demand both in their own and in other industries, and education for social and economic planning and development. This kind of "economic literacy," a precondition for worker self-management and for a proactive labor movement, is not a significant part of any of the prevailing models of labor education.

The need for economic literacy translates to the need for increasing sophistication regarding the role of the economy among the American populace. Since workers now face job retraining and job change as a matter of course in their work lives, they need to understand how the job market is affected by various trends in order to be effective in their life and work planning. Not only individual workers but also entire communities find their futures in jeopardy as a result of economic changes. Community members require information and the skills to use that information to plan successfully for their future.

Possible components of economic literacy are:

- Basic economic terminology, such as that used in the media and in policy statements to describe economic changes
- Basic economic data, particularly those used to convey to the public what is happening in the economy
- Information on specific industries that touch the clients' lives most directly
- Occupational/job-related skills, particularly those necessary to function in the changing workplace
- Knowledge and skills necessary for the new level of community participation necessary in economic planning and development decisions
- Knowledge necessary to understand the global economy and how it affects the local, regional, and national economies
- Some basic knowledge of consumer economics.

The American economy has always been in transition, but in the last several decades these changes have taken place at a much faster rate. The need for informed participation regarding the economy and how it relates to an individual's life makes economic literacy more critical than ever before. A proactive teaching strategy enables adult workers to get information and to make critical decisions about the economy as it affects a particular workplace, a job search, or larger economic developments in the country and the world.

One method of teaching and learning economic literacy that was used in several alliance projects was that of participatory research. Participatory research is an integrated approach that combines research, education, and action around an issue or issues deemed important for a community, workplace group, or other collectivity. Central to this approach is the conviction that residents or members of these groups can learn to define their issues, do most of their own research, educate each other, and participate in collective activities to solve their problems.

Two rural community economic development projects, in particular, are involving their communities in this way. In the Southeast, the Highlander Research and Education Center in New Market, Tennessee, is sponsoring the Highlander Economics Education Project. This project operates a participatory research and education program that enables residents of rural Appalachian communities to deal more effectively with the impact of the changing economy on their lives. The project develops models of cooperation as local community colleges and grass-roots community groups work together to meet community and individual needs resulting from current economic change. It also develops an economics curriculum that provides the rural residents with the educational base for dealing with ongoing economic change.

The success of the READI project in Idaho is based on the careful way that the project staff worked with an advisory group on a county-by-county basis and trained local resource people to teach the classes. With limited resources, community groups learned how to utilize educational strategies relating to their rural isolation and ways to identify how technology could spur economic development.

When education and community groups work together and design an educational process to provide the tools to identify and analyze the varied resources that the community has, a new learning constituency is established. This permits communities to look at how larger economic forces affect them, to identify the possible options for revitalizing the local economy, to decide on the most desirable approaches, and to develop the feasible and best strategies.

Liberal Education. The impetus for educators to get involved with economic problems is usually an immediate need arising from rapid changes in labor market conditions. This urgency encourages employers, faculty, and advisers to think initially only about the short term. But these educational partnerships with business could offer the learners a whole new kind of liberal education. It is probably useful to distinguish between the "liberal arts," traditionally defined as a substantive body of knowledge that defines and shapes culture, society, and ideas, and "liberal education," in this sense, an education or learning experience liberating one personally and providing the skills and knowledge to be more effective, self-confident, competent, and self-directed.

The valued characteristics of a liberal education include:

- Critical and analytical skill development
- Formation of abstract concepts
- Comparative analysis of abstractions
- Learning to learn
- Objectivity.

While abstract discussions may emphasize differences between vocational and academic education, the case studies in this sourcebook reveal that, in practice, both endeavors seek to transmit the same underlying skills. Skinner, Siefer, and Shovers highlight this point in Chapter Two:

> The Language Working training program helped to develop the kind of worker that industry wants and liberal education promotes: an individual trained to communicate effectively, think critically, make decisions, and work as part of a team. The program emphasized the dynamic language skills required to cope with the changing nature of today's work environments. Worker-students learned strategies for adapting to change and for acquiring and imparting new knowledge.

Summary

As continuing educators give more emphasis to problems arising from the changing economy, they are faced with the issues of forming partnerships (or some type of new collaborative arrangement) with business, organized labor, government, and community groups. The case studies presented in this volume and the lessons derived from them can be utilized as a springboard for creative planning of new partnerships that integrate education and work while realizing the unique local issues of each community.

Effective continuing education providers should use these linkages and partnerships to help adult learners develop the knowledge and skills necessary to *continue* to learn for their changing roles in the workplace and the community. Integrating education and work, then, becomes a powerful ongoing strategy for all organizations involved and for adult learners taking charge of their lives, careers, and community development.

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Questions and issues are raised for the future of integrating education and work.

Critical Questions and Issues for Integrating Education and Work

Ivan Charner, Catherine A. Rolzinski

Is the integration of education and work merely a passing fad, or does it represent a fundamental shift for the role of continuing education? The changes anticipated for the economy will continue to apply pressure on education to become more involved in economic, community, and human resource development, suggesting that a fundamental shift in the relationship between continuing education and work is at hand. In this concluding chapter, we present a set of critical questions and issues for continuing education. These questions provide a perspective for looking at the future integration of education and work. The framework presented in Chapter One is used to organize the questions and issues.

Clients

Will the future parallel the present with regard to clients? Can adult and continuing education effectively serve the needs of individual adult learners while increasingly trying to respond to the wants and desires of businesses, unions, and community organizations? It seems safe to conclude that declining enrollments of traditional-age students combined with

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budget constraints due to tax and fiscal policies will require the continuing education enterprise to seek new clients. These new clients will not only include new groups of adult workers (such as women, older workers, immigrants, retirees, union members, and rural adults) but also organizations, such as businesses, community groups, and unions. The first question for continuing educators, then, is: How can more programs like those described in this volume be developed to attract new clients to the continuing education system?

A second question follows naturally from the first: How can continuing educators identify the education and training needs of these diverse client groups? If continuing education providers look to businesses and other organizations as their primary client groups, how will this affect services to individual adult workers? Are the goals and needs of these client groups in conflict, or can both be served through one system? Are the concepts of "economic literacy" and "liberal education" in conflict, or can they go hand in hand to the betterment of all? Finally, will the notion of "who can pay" determine who will be served by the continuing education system? Or can a balance be reached so that all of those in need of continuing education and training programs can be served?

Content

As demographics, economics, and technology continue to change, what are the skills, information, knowledge, and attitudes that adults and organizations will need? How can the content of continuing education and training be responsive to the shifts that are anticipated? The case studies presented in this volume represent a growing number of postsecondary programs that are providing a wide range of content in education and training. Basic skills and remedial courses are being offered by corporations in increasing numbers. Adult basic education and literacy programs are also on the rise among community organizations. At the same time, two- and four-year colleges are offering basic skills programs to adults. Will these programs, operating at the workplace, in the community, and in educational institutions, have to grow as more adults are found to have inadequate basic skills preparation to meet the challenges of the future?

Continuing education programs in job skills (vocational, retraining, and upgrading) have also been on the upswing. As new technologies have been developed and as sectors of the labor force have been affected by economic shifts, the need for new skills has been created. Continuing education programs offered by diverse sources have been responding to this need. How can continuing educators better anticipate these changes throughout the remainder of this century and well into the next? If the nation's businesses and human resources are to keep pace with technological shifts and economic changes, will more programs for retraining, upgrading, international trade, and skill development have to be made available to broader populations of businesses and adult workers?

As new technologies are developing and as sectors in the labor force are changing, it is predicted that managers and professionals will need new knowledge in diverse areas ranging from specific skills, to entrepreneurship, to human resource planning. What will be the appropriate role for continuing education in professional skill upgrading to keep pace with technological and economic shifts and in management skill development to be responsive to the changing nature of the workplace and the adult worker? The roles and responsibilities of business, education, government, and individuals in the changing work environment have yet to be worked out.

Outreach, counseling, and information services are being made available to various client groups through continuing education programs. As the economy continues to change, will there be a need for increasing such services, and, if so, is the continuing education enterprise the most appropriate institutional base for providing personal and family counseling? Should continuing education be the source of information on the structure and dynamics of the local labor market; education and training opportunities; new technologies; human resource planning and development; projected supply-demand imbalances in human resources; and changes in economic structures? How can educational institutions work with other organizations to provide the support services that may be needed in the future?

A few other questions related to the content of continuing education and training should be considered in response to changing realities. First, as the population ages and a larger proportion faces retirement, what role will continuing education play in offering programs and services to this segment of the population? Clearly, some persons will need to be trained or retrained in order to continue to earn a living (or to supplement retirement income). Others will need vocational or avocational programs as they are faced with more free time. Are approaches that integrate these new learners with students of other age groups better, or does this population require its own set of programs?

Second, the role of general/liberal/humanistic education in a changing economy needs to be examined. Should continuing educators take the lead in refocusing the nation's attention on the importance of this category of education in the years ahead? Should programs on humanities and business, liberal arts and technology, critical thinking, and so on, be developed as necessary alternatives to existing approaches to vocational training? What is the role of liberal and general education in "education for work" programs? How can work-, job-, and career-oriented programs be used as vehicles for teaching critical thinking, abstract reasoning, and learning-to-learn skills commonly transmitted through liberal arts and humanities programs? What should the balance be between liberal arts and the humanities as a vehicle for preparation for work, on the one hand, and education for work as a vehicle for transmitting general and liberal arts skills and knowledge on the other?

Third, what is the appropriate role for continuing education to play in relationship to economic literacy and to community-level planning and facilitation of economic development? Should continuing education institutions take the lead in developing strategies in these areas, or should they be participants in a process initiated by other organizations?

Finally, as new management approaches call for increased worker participation in decisions, is it necessary for programs to be offered to adult workers that provide them with critical-thinking skills appropriate to these new roles? Also, as individuals are faced with increasing job and career changes, will they need more programs that provide skills and opportunities for decision making based on reliable information? Will such programs be in direct conflict with services to meet the needs of businesses and corporations?

Modes of Delivery

Different modes have long been used to deliver continuing education and training to adults. As changes in the economy affect postsecondary education, will increased reliance on alternative methods be necessary? In addition to the traditional learning approaches of lectures and small-group lecture-discussions, other approaches should be explored.

Can new approaches to scheduling, course structure, timing, and method of instruction offer continuing education and training opportunities to larger numbers of different clients? Use of new technologies such as teletext, teleconferencing, interactive video, and computers can also offer learning approaches to wide audiences. How can education and training institutions be more flexible in their delivery of programs to learners? Experiments and demonstrations that use alternative modes of delivery should be tried. Unless the traditional providers of continuing education and training are willing to offer alternatives to the standard approaches, they may lose out to other providers of postsecondary education who are willing and able to offer almost any course or program at almost any time, almost anywhere. Up to $40 billion that is currently spent by corporations for training is at stake. As individuals and organizations respond to changes in technology and in the economy, they will want educational delivery systems that help them to move quickly and efficiently.

Sources

Sources of continuing education and training are abundant and diverse. As the labor market continues to change in response to demographic and economic shifts, these sources of education and training should become more responsive. Will new programs be needed as more workers are displaced or as more move into the information and service sectors of the labor force? Will continuing educators need to look closely at the other sources of education and training to fill gaps in programs, adults served, and services offered? How can the more traditional providers of continuing education programs recognize the magnitude and importance of the "shadow" education system and develop partnerships to reduce overlap, redundancy, and competition in an attempt to serve better both employees and employers?

Are new sources of education and training needed in the near future, or can better use be made of existing sources to respond to the changing economic and social realities facing the nation in the next quarter century?

Summary

A number of critical questions and issues concerning the clients, content, delivery, and sources of the continuing education enterprise have been raised. They bring into focus the dramatic changes in the continuing education system that may result from changes in the direction and pace of the economy. They also make clear the need for integrating education and work as an effective way of responding to these changes.

The discussion in Chapter Eight of the factors central to developing productive partnerships offers a set of new considerations and directions for integrating education and work. Policy makers and practitioners are encouraged to examine these alternatives in light of the questions and issues raised above. For continuing education to be responsive to the needs of new client groups, it must look beyond its traditional role toward its emerging role in economic, community, and human resource development. It must be more proactive in its responses to the diverse needs of a diverse society. The continuing education system cannot work alone; it needs to work in partnership with businesses, unions, government, and community organizations. Nor can the continuing education system offer limited options; it must offer a comprehensive set of services delivered in a variety of ways to individuals and organizations. And continuing educators cannot only be concerned with education; they need to be equally concerned with learning—learning that empowers individuals and organizations not only to respond to but also to anticipate the changes they will be facing in the future. Continuing educators must recognize that the integrating of education and work is not a passing fad. Rather, it is a strategy that offers exciting opportunities for a challenging future.

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APPENDIX

List of Projects of the FIPSE Education and the Economy Alliance

Applied Basic Skills: Education for Work
Robert Lee
Jobs for Youth, Inc.
Chicago, Ill.

Cascade Business Development Center: A Small Business Incubator
Samuel Brooks
Portland Community College
Portland, Oreg.

Educational Bridges to Options in High-Technology Employment
Celia Marshak
San Diego State University
San Diego, Calif.

Educational Maintenance Organization
Maxine Ballen Hassan
Business Development and Training Center
Malverne, Pa.

The Employment Transition Program
Jeanne Prial Gordus
University of Michigan
Ann Arbor, Mich.

English-Language Training for the Workplace
Elizabeth Skinner
Arizona State University
Tempe, Ariz.

Evaluating Noncollegiate-Sponsored Instruction
Timothy Donovan
Community Colleges of Vermont
Winooski, Vt.

The Experienced Workers Retraining Program
Michael Maguire
St. Louis Community College-Forest Park
St. Louis, Mo.

The Foresight Program: Education for Career Management in a Changing Economy
William Charland
University of Denver
Denver, Colo.

Fulfillment of the Liberal Arts Mission Through Education and Research for Area Economic Recovery
John Agria
Thiel College
Greenville, Pa.

Graduate Professional Education for Information Specialists in an Electronic Age
Richard Budd
Rutgers University
New Brunswick, N.J.

Highlander Economics Education Project
John Gaventa
Highlander Research and Education Center
New Market, Tenn.

Intensive In-Plant Technician Training Project
Stacey Ayers
Rio Salado Community College
Phoenix, Ariz.

The International Trade Technical Center
Barbara Moebius
Waukesha County Technical Institute
Pewaukee, Wis.

New Hampshire Industrial Consortia Project
Eric Brown
New Hampshire College and University Council
Manchester, N.H.
and
William Andrews
Monadnock Training Council
Milford, N.H.

PIC/Higher Education Collaboration Project
Robert Knight
National Association of Private Industry Councils
Washington, D.C.

Postsecondary Adult Literacy Education Project
John David
West Virginia Institute of Technology
Montgomery, W.Va.

Postsecondary Education for a Changing Economy: Resource Agent for Policies and Practices
Ivan Charner
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Washington, D.C.

Preparing for High-Technology Careers in Computer-Integrated Manufacturing
Victor Langer
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Public Investment in Higher Education: A Program for New England Legislators
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READI: Rural Education/Adult Development in Idaho
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Moscow, Idaho

School for New Learning Graduate Program
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TECPLAY: Technical Education and Career Planning for the Lives of Adults and Youths
Ann Baker
Charleston Higher Education Consortium
Charleston, S.C.

Upper Division BSN for Working RNs
Michael Petrides
The College of Staten Island
Staten Island, N.Y.

Worker Education for the 1980s
  Charles Derber
  Boston College
  Chestnut Hill, Mass.

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